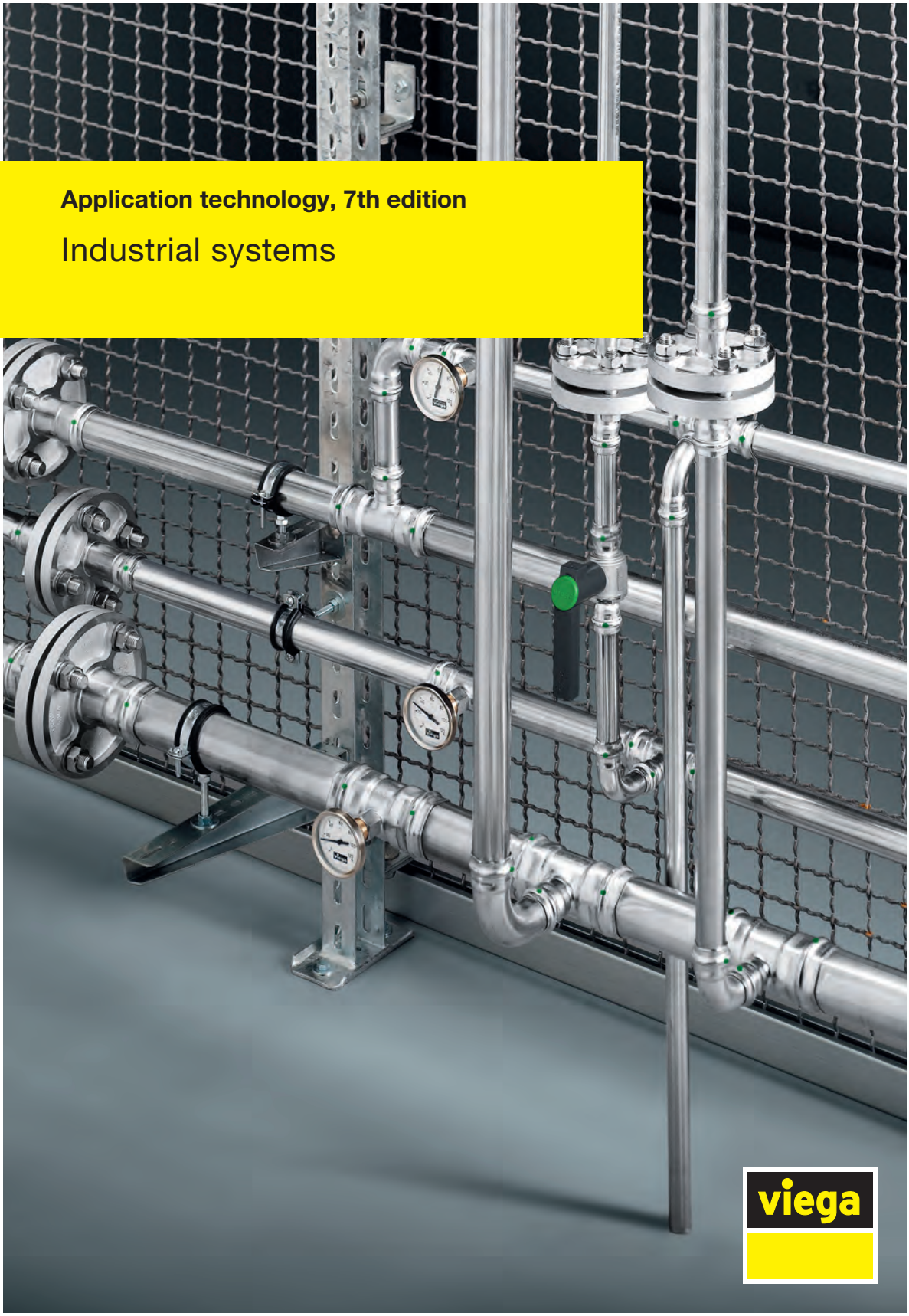
Application technology, 7th edition

Industrial systems



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Foreword

Dear expert,
Over the course of the years the requirements as regards industrial media-carrying piping systems have grown continuously.
The keywords here are

- Warranty
- Functionality of machines and systems – and their quick restoration in the event of faults
- Corrosion resistance of components
- Use of auxiliary materials
- Fire protection
- Energy efficiency
- Drinking water hygiene

To date, Viega has primarily followed these changes with regard to building installations. For many decades now installers have seen us as the leading system provider on the market. In particular, our "cold" press connecting technology for the piping systems for potable water, heating, gas and a wide range of other media has revolutionised installation practices. The reasons for this remain the technology's rapid processing, the economic advantages as well as the enhanced safety thanks to SC-Contur which ensures that any connections which are accidentally unpressed become evident during leakage testing.
These are the specific benefits which have accelerated the spread of this rapid and advanced press connecting technology in industrial pipeline installations as well. The time savings for new builds and for the maintenance of installations together with the fact that when working in sensitive production processes there is no need for a naked flame to connect pipes round off the advantages of this modern press connecting technology. In addition, Viega offers installers a unique selection of piping systems ranging from stainless steel, galvanised steel, copper and copper nickel through to PE-X pipe systems. Different sealing elements for the various media requirements paired with the ideal pipe and connecting material in each case guarantee the ideal solution for all applications, including systems free of paint-wetting impairment substances for the automotive and painting sectors.

This is reason enough for Viega to compile the diverse options offered by its system technology for pipeline installations in a single application technology brochure. This brochure covers media-related applications, processing and mounting instructions as well as special solutions. This new tool is complemented by the know-how of the specialists in Viega's industrial sales team and the technical hotline who are on hand to answer the various enquiries and challenges presented by industrial customers and installers.
We would like to take this opportunity to wish you every success when working both in the office and on site.

Our innovations are steeped in tradition

Behind the Viega name is a family enterprise that has always stood for the highest levels of product quality, customer proximity, delivery reliability and service. The original foundry has now become the market leader for press connecting technology for potable water and gas installations as well as piping systems for plant engineering.

Press connecting technology experience

The establishment of press connecting technology in domestic installations is also closely linked to the Viega name and brand. Back in 1989 Viega launched a corrosion-free and dimensionally stable stainless steel press connector system to complement the Sanfix-PE-X system which was introduced in 1983. Parallel to the introduction in sanitary engineering, this advanced procedure also gained ground in the industrial plant engineering sector where the benefits of time-saving connecting technology without a naked flame were particularly valued. The market launch of Profipress for copper pipe installations in 1995 served to change the installation practices of an entire sector around the world and breathed new life into industrial piping technology. With its programme which also includes galvanised steel, today Viega offers a unique range to satisfy even the most stringent demands.

Quality and service

With its 17,000 products, Viega offers a range of products and delivery reliability which is unparalleled in the sector. From the connection of connection lines for potable water and gas supplies through to floor installations, our product portfolio represents system expertise which confirms that even for plant manufacturing, Viega's press connecting technology offers the ideal solution. We set the standard in terms of quality controls and service. With our comprehensive range of seminars we offer further training in line with market needs, e.g. on changes to regulations, potable water and gas as well as laying procedures and work safety.

Systematic plant engineering

Take advantage of our many years of experience. Viega offers extensive solutions for industrial pipeline installations which combine the advantages of our time- and cost-saving press connecting technology with the safety and reliability of indestructible materials. This application technology brochure provides further details on specific solutions using our premium products which will ensure greater efficiency and cost effectiveness for you.
Attendorn, June 2017
The Viega team

Conversion Bar / Pascal

bar	MPa	mbar	hPa
1	0.1	1,000	1,000
0.1	0.01	100	100
0.01	0.001	10	10
0.001	0.0001	1	1

Press connector systems

System descriptions

The following Viega press connectors systems are used in particular for industrial applications
- Profipress/XL
- Profipress G/XL
- Profipress S
- Sanpress/XL
- Sanpress Inox/XL
- Sanpress Inox G/XL
- Prestabo/XL
- Megapress
- Megapress G
- Megapress S XL

The various operating states of the media, e.g. pressure, temperature and concentration, demand careful selection of the system and material for press connectors, pipes and seals. In the case of special media with distinct operating conditions, Viega provides support with its laboratory tests which can also be assisted by external institutes. The resulting application recommendations enable correct execution and a high level of operational safety whilst using efficient mounting techniques.
An overview of the numerous media/material combinations can be found as an appendix to this brochure,
“Media list” on page 156.

Press connector systems made of copper and stainless steel are used in systems for
- Compressed air
- Cooling water
- Technical gases
- Non-potable water
- Treated process water
- Oil-based media

In-house and external continuous material tests ensure the consistent quality of our products. The demands which we place on our products during testing are well in excess of the specified values.

Common equipment features

SC-Contur

All Viega press connectors feature the DVGW-certified SC-Contur. This allows any inadvertently unpressed connections to be detected and pressed in good time. During "dry" leakage tests with gases, Viega guarantees the identification of unpressed connections in the pressure range 22 hPa to 0.3 MPa, in the case of a wet leakage test with water from 0.1 to 0.65 MPa.

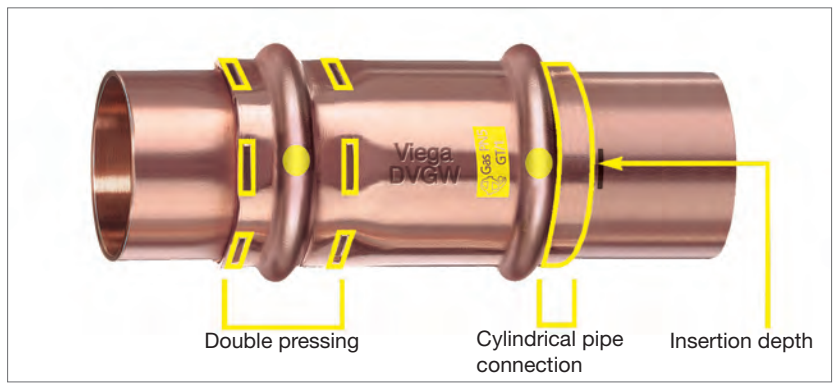


Fig. 1: SC-Contur of a Profipress G press connector

Testing criteria	Requirement acc. to DVGW-W 534	Viega testing values
Compression strength	At least 2.5 MPa	5.0 to 20 MPa
Pressure surge	10,000 loads between 0.1 and 1.5 MPa, at room temperature	100,000 loads between 0.1 and 1.5 MPa, at room temperature and 95 °C
Thermal shock resistance	10,000 loads, 15 minutes alternating between 20 °C and 95 °C, at a pressure of 1.0 MPa and pipe prestressing of 2 N/mm²	10,000, 15 minutes alternating between 20 °C and 95 °C, at a pressure of 1.0 MPa and pipe prestressing of 2 N/mm²
Vacuum	-0.08 MPa; P_{abs} = 200 hPa	
Sealing elements	Special tests	

Tab. 1: Viega quality tests for Sanpress/Sanpress Inox/Profipress

The use of the press connector systems for media other than that described in this section must be approved by the Viega Service Center.

Sealing elements
Elastomeres are used as sealing materials in press connectors. Their composition influences the mechanical and chemical properties and thus the suitability for certain media.

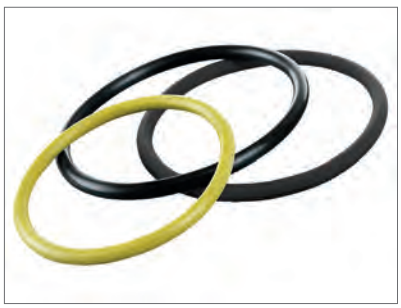


Fig. 2: Sealing elements for Viega press connectors

- EPDM – Ethylene propylene diene rubber
  - For potable water installations, operating temperature 85 °C, T_{max}= 110 °C
  - For heating installations ≤ 110 °C
  - For synthetic oils
  - Not suitable for mineral oils and mineral oil-based greases
- HNBR – Acrylonitrile butadiene rubber
  - For mineral oils and greases
  - For hydrocarbons
  - For gases acc. to G260 from -20 to 70 °C
- FKM – Fluorine carbon rubber
  - For high chemical loads, briefly up to 280 °C
  - For solar and district heat supply systems (as of entry into the building) with high media temperatures

Abbreviation	EPDM	HNBR	FKM
Material	Ethylene propylene diene rubber	Acrylonitrile butadiene rubber	Fluorine elastomer
Colour	Polished black	Yellow	Matt black
Operating temperature [°C]	110	70	140
Pressure [MPa]	1.6	MOP 5/GT1/GT5[1]	1.6
KTW	Yes	No	No
HTR	No	Yes	No

Abbreviation	EPDM	HNBR	FKM
Areas of application	Potable water, heating, solar flat collectors	Gases acc. to G 260, heating oil acc. to DIN 51603-1, diesel fuels acc. to DIN EN 590	Solar tube collectors, district heating supply[2] (as of entry into the building), steam systems

Tab. 2: Technical data/application of sealing elements
[1]Depending on the press connector system [2]Subject to agreement

Profipress system overview

Press connectors made of copper and gunmetal or silicon bronze – copper pipelines

Areas of application

Depending on the material used for the sealing element, Profipress press connectors are approved for different applications. The colour coding is located on the bead on the press connection.

- Green for potable water installations, e.g. with Profipress
- Yellow for gas, liquid gas and oil installations, e.g. with Profipress G
- White for special applications, e.g. with Profipress S

Fig. 3: Sanpress XL press connector 76.1/88.9/108.0 mm – made of gunmetal or silicon bronze

Fig. 4: Profipress press connector with press and threaded connections

Fig. 5: Profipress press connector
– up to size 54.0 mm made of copper

Profipress/XL

Press connectors made of copper/gunmetal or silicon bronze – copper pipelines

System description

With regard to the possible exceeding of the limit value for copper ions according to the Potable Water Ordinance (TrinkwV), pipes and connectors made of copper may only be used

- if the pH value is ≥ 7.4 or
- the total volume of organic carbon does not exceed TOC = 1.5 mg/l at values between pH= 7.0 – 7.4!

Note for copper pipes with internal tin plating acc. to DIN 50930-6:

Copper pipes with internal tin plating can be used for all potable water in combination with non-tin-plated copper press connectors according to the Potable Water Ordinance (TrinkwV). There is only a negligible risk of the limit value being exceeded due to the migration of copper ions into the tap water as a result of the comparatively low surface areas of the non-tin-plated connectors vis-à-vis those of the pipes.
Further information on the use and impact of copper alloys can be found in DIN EN 12502-2. Should you have specific questions, please contact Viega's technical consultation team: service-technik@viega.com

The system is set up for the following operating conditions
- Operating pressure p_{max} = 1.6 MPa
- Operating temperature 85 °C, T_{max} = 110 °C

Note:
Components made of copper may not be installed upstream of galvanised ferrous materials – note the flow rule!

Fig. 6: Profipress XL press connector – 64.0 mm made of copper

Fig. 7: Profipress XL connector with press and threaded connections

Technical data

Pipe material
Copper pipes according to DIN EN 1057 and DVGW worksheet GW 392

Press connector material
- Standard sizes 12 to 54 mm — copper
- XL sizes 64.0 mm — copper
- 76.1 / 88.9 / 108.0 mm — gunmetal or silicon bronze
- Press connector with threaded connection — gunmetal or silicon bronze

Standard sealing element
EPDM (Ethylene propylene diene rubber); polished black; up to 110 °C

Delivery state
Rods and rolls (see Tab. 3)
Pipes tested for leak tightness and marked

Certification – system
- Profipress with SC-Contur DVGW Reg. No. DW-8511BQ0586
- Profipress XL with SC-Contur DVGW Reg. No. DW-8511BQ0586

Certification – pipes
DIN EN 1057 and DVGW worksheet GW 392

Nominal dimensions Profipress/XL [mm]
12/15/18/22/28/35/42/54/64.0/76.1/88.9/108.0

Delivery range d x s [mm]	Rods hard	Rods semi-hard	Rings soft	Sizes	Press connector material
12 x 0.8	✓	✓	✓	Standard	copper
15 x 1.0	✓	✓	✓		
18 x 1.0	✓	✓	✓		
22 x 1.0	✓	✓	✓		
28 x 1.0	✓	✓	–		
35 x 1.2	✓	–	–		
42 x 1.2	✓	–	–		
54 x 1.5	✓	–	–		
64.0 x 2.0	✓	–	–	XL	Gunmetal or silicon bronze
76.1 x 2.0	✓	–	–		
88.9 x 2.0	✓	–	–		
108.0 x 2.5	✓	–	–		

Tab. 3: Pipe sizes, delivery forms

Profipress G/XL

Copper, gunmetal or silicon bronze press connector – copper pipelines

System description

The press connector systems Profipress G and Profipress G XL are suitable for gases according to DVGW worksheet G 260 for domestic use. The implementation rules acc. to DVGW worksheet G 600, TRGI 2008 and TRF 2012 apply for installation.
Only copper pipes according to DIN EN 1057 in connection with DVGW worksheet GW 392 are to be used.
Certification exists for

- Gases in acc. with DVGW worksheet G 260
- Liquid gas in gas phase[1] for domestic use
- Operating pressure $p_{max} = 0.5$ MPa
- Operating pressure with HTR requirement $p_{max} = 0.1$ MPa
- Operating and ambient temperature T = -20 to 70 °C

[1] Sanpress Inox G is to be used for liquid gas installations in areas with higher thermal resistance (HTR) requirements, with a pick-up pressure for the CRV slanted seat valve in the pressure regulating valve of > 0.1 MPa.

HTR requirement

The press connectors and other components used in gas installations must satisfy the test criteria for "higher thermal resistance (HTR)". At 640 °C the

criterion for higher thermal resistance is based on the ignition temperature of a natural gas/air mixture when reaching the explosion limit of 5 to 15 volume percent.

Fig. 8: Profipress G system overview

If, in the event of a fire, the installation components remain intact up to 640°C, there is enough time to cut off the gas supply before leaking gas can cause greater damage. The load requirements of 650 °C for 30 minutes for components in gas installations resulting from the facts outlined above have proven effective and represent the generally recognised rules of engineering.

Technical data

Pipe material
Copper pipes according to DIN EN 1057 and DVGW worksheet GW 392

Press connector material
Copper/gunmetal or silicon bronze

Quality control
Continuous in-house testing and testing by the NRW material testing institute. Warranty and liability agreement with the Association for Sanitation, Heating and Air Conditioning (ZVSHK)

Marking
Yellow marking on the bead on both sides of the press connection.

Sealing element
Yellow HNBR sealing element

Press tools
Viega press machines see “Press tools” on page 78

Profipress G	12 to 54 mm with press jaws
Profipress G XL	64.0 mm with press ring

DVGW approval number (German Technical and Scientific Association for Gas and Water)

Profipress G	DG-4550AU0070
Profipress G XL	DG-4550AU0070

d x s [mm]		Delivery range hard	semi-hard	soft
12 x 0.8	Profipress G	✓	✓	✓
15 x 1.0		✓	✓	✓
18 x 1.0		✓	✓	✓
22 x 1.0		✓	✓	✓
28 x 1.0		✓	✓	–
35 x 1.2		✓	–	–
42 x 1.2		✓	–	–
54 x 1.5		✓	–	–
64.0 x 2.0	XL	✓	–	–

Tab. 4: Minimum wall thicknesses according to DVGW worksheet GW 392

Press connector marking

Profipress G and Profipress G XL press connectors are marked as follows

- Gas for gas supply lines
- MOP5 for maximum operating pressure 0.5 MPa
- GT1 for higher thermal requirement (HTR at 0.1 MPa operating pressure)
- for certification in the Netherlands (sizes 12 – 54 mm)
- for certification in Poland (sizes 12 to 54 mm)

Profipress S

Press connectors made of copper/gunmetal or silicon bronze – copper pipelines

System description

Profipress and Profipress S press connectors are technically identical with the exception of the sealing element inserted in the factory and the marking, see “Profipress/XL” on page 15. Profipress press connectors up to size 35 mm which are subsequently fitted with FKM sealing elements can be used together with the Profipress S press connectors without any restrictions.

Profipress S press connectors are suitable for use in heating systems with temperatures during continuous operation of ≤ 140 °C and brief peak temperatures of ≤ 280 °C in connection with copper pipes according to DIN EN 1057.

Use together with Profipress press connectors is permitted if these have been fitted with FKM sealing elements on-site.

The use of Profipress S for transporting media with additives (e.g. corrosion or anti-freeze) in heating water or for other uses, other than those described, must be approved by the Viega Service Center.

Operating conditions for district heat supply systems (as of entry into the building)

- Operating pressure $p_{max} \leq 1.6\,MPa$
- Operating temperature $T_{max} \leq 140\,°C$

Operating conditions for low-pressure steam systems

- Operating pressure $p_{max} \leq 0.1\,MPa$
- Operating temperature $T_{max} \leq 120\,°C$

Note:
The use of Profipress S and Profipress press connectors with FKM sealing elements in potable water and gas installations is not permitted!

Fig. 9: Profipress S press connectors

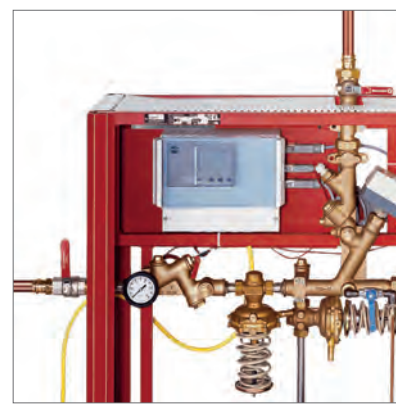


Fig. 10: Application: District heating transfer station

Fig. 11: Application: Solar collector

Technical data

Pipe material
Copper pipes according to DIN EN 1057 and DVGW worksheet GW 392

Press connector material
Size 12 to 35 mm copper

Sealing element
Matt black; FKM (fluorine rubber); briefly up to 280 °C

Certification
see Profipress

Nominal dimensions [mm]
12/15/18/22/28/35

Sealing element d x s	Profipress	Profipress S
12 x 2.4	EPDM polished black	FKM matt black
15 x 2.5		
18 x 2.5		
22 x 3.0		
28 x 3.0		
35 x 3.0		
42 x 4.0		–
54 x 4.0		
76.1 x 5.0		
88.9 x 5.0		
108.0 x 5.0		

Tab. 5: Combinable sizes Profipress/Profipress S

Sanpress/XL

Press connector made of gunmetal or silicon bronze – pipelines made of stainless steel 1.4401 and 1.4521

System description
The system is set up for
- Operating pressure $p_{max} \leq 1.6$ MPa
- Operating temperature 85 °C, $T_{max} \leq 110$ °C

Operating conditions for low-pressure steam systems (replacement of sealing elements)
- Operating pressure $p_{max} \leq 0.1$ MPa
- Operating temperature $T_{max} \leq 120$ °C

Note:
Protect against high concentrations of chloride generated by both the medium and by external factors.

Fig. 12: Sanpress press connector – 12 to 54 mm made from gunmetal or silicon bronze

Fig. 13: Sanpress XL press connector – 76.1 to 108.0 mm made from gunmetal or silicon bronze

Fig. 14: Sanpress system overview

Technical data

Pipes

Two types of stainless steel, laser welded, corrosion-proof

- Material No. 1.4401 (X5CrNiMo 17-12-2), with 2.3% molybdenum for increased durability; marking yellow plug
- Material No. 1.4521 (X2CrMoTi 18-2), with PRE-value 24.1; marking green plug

Delivery state

6 m rods, polished outer and inner surface, tested for leak tightness and marked, pipe ends sealed with plugs

Press connector material

Gunmetal or silicon bronze

Sealing element
EPDM (Ethylene propylene diene rubber); black, up to 110 °C

Certification
- Sanpress with pipe material 1.4521
  - DW-8501BS0377 12–108.0 mm
- Sanpress with pipe material 1.4401
  - DW-8501AP3032 12–108.0 mm
- Sanpress XL

Applicable standards
DVGW worksheet GW 541: Pipes made from stainless steel for potable water installations; DIN EN 10088; DIN EN 10312

Nominal dimensions [mm]
12/15/18/22/28/35/42/54/76.1/88.9/108.0

d x s [mm]	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]	Weight per 6 m rod [kg]
12 x 1.0	0.08	0.27	1.60
15 x 1.0	0.13	0.35	2.10
18 x 1.0	0.20	0.43	2.55
22 x 1.2	0.30	0.65	3.89
28 x 1.2	0.51	0.84	5.02
35 x 1.5	0.80	1.26	7.55
42 x 1.5	1.19	1.52	9.13
54 x 1.5	2.04	1.97	11.83

Tab. 6: Sanpress/XL pipes

d x s [mm]	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]	Weight per 6 m rod [kg]
76.1 x 2	4.08	3.70	22.20
88.9 x 2.0	5.66	4.34	26.00
108.0 x 2.0	8.49	5.30	31.80

Tab. 7: Sanpress-XL pipes

Sanpress Inox / XL

Press connector stainless steel – stainless steel pipelines 1.4401 and 1.4521.

System description

The system is set up for

- Operating pressure p_{max} = 1.6 MPa
- Operating temperature 85 °C, T_{max} = 110 °C

Note:
Protect against high concentrations of chloride generated by both the medium and by external factors.

Fig. 15: Sanpress Inox press connector – 15 to 54 mm made of stainless steel

Fig. 16: Sanpress Inox XL press connector – 64.0 to 108.0 mm made of stainless steel

Fig. 17: Sanpress Inox – system overview

Technical data

Pipe material
Two types of stainless steel, laser welded, corrosion-proof
- Material No. 1.4401 X5CrNiMo 17-12-2, with PRE value 24.1; with 2.3 % molybdenum for increased durability; marking: yellow plug
- Material No. 1.4521 X2CrMoTi 18-2, with PRE value 24.1; marking: green plug

Press connector material
All sizes stainless steel

Delivery state
6 m rods, polished outer and inner surface, tested for leak tightness and marked, pipe ends sealed with plugs

Sealing elements
EPDM (Ethylene propylene diene rubber); black, up to 110 °C

Certification
- Sanpress Inox with pipe material 1.4521
  - DW-8501BS0376 15 – 108.0 mm
- Sanpress Inox with pipe material 1.4401
  - DW-8501BL0551 15 – 108.0 mm

Applicable standards
DVGW worksheet GW 541: Pipes made from stainless steel for potable water installations; DIN EN 10088; DIN EN 10312

Nominal dimensions [mm]
15/18/22/28/35/42/54/64.0/76.1/88.9/108.0

d x s [mm]	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]	Weight per 6 m rod [kg]
15 x 1.0	0.13	0.35	2.10
18 x 1.0	0.20	0.43	2.55
22 x 1.2	0.30	0.65	3.89
28 x 1.2	0.51	0.84	5.02
35 x 1.5	0.80	1.26	7.55
42 x 1.5	1.19	1.52	9.13
54 x 1.5	2.04	1.97	11.83

Tab. 8: Sanpress Inox/-XL pipes

d x s [mm]	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]	Weight per 6 m rod [kg]
64.0 x 2.0	2.83	3.04	18.24
76.1 x 2.0	4.08	3.70	22.20
88.9 x 2.0	5.66	4.34	26.00
108.0 x 2.0	8.49	5.30	31.80

Tab. 9: Sanpress Inox XL

Seapress/XL

Press connector CuNi10Fe1.6Mn – seamless pipes made of CuNiFe 1.6Mn acc. to DIN 86019, EN 12449

System description

The system is suitable for

- Fire extinguishing and fire protection systems
- Sprinkler systems
- Seawater cooling
- Bilge and ballast systems
- Seawater desalination systems
- Operating pressure p_{max}= 1.6 MPa
- Operating temperature 85 °C, T_{max} = 110 °C

Fig. 18: Seapress press connector – 15 to 54 mm made of CuNiFe

Fig. 19: Seapress XL press connector – 76.1 to 108.0 mm

Technical data

Pipe material

Seamless pipes made of CuNiFe 1.6Mn according to DIN 86019, EN 12449 (KM Europa Metall AG)

Press connector material

CuNi10Fe1.6Mn

Sealing elements
According to requirements of EPDM, FKM, HNBR

Nominal dimensions [mm]
15/18/22/28/35/42/54/76.1/88.9/108.0

d x s [mm]	DN Nominal width	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]
15 x 1.0	12	0.13	0.39
22 x 1.0	20	0.31	0.59
28 x 1.5	25	0.49	1.11
35 x 1.5	32	0.80	1.37
42 x 1.5	40	1.19	1.68
54 x 1.5	50	2.04	2.20

Tab. 10: Seapress pipes according to DIN 86019, EN 12449

d x s [mm]	DN Nominal width	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]
76.1 x 2.0	65	4.07	4.14
88.9 x 2.0	80	5.67	4.86
108.0 x 2.5	100	8.33	7.37

Tab. 11: Seapress-XL pipes

Certification

Lloyd's Register

DNV GL

American Bureau of Shipping

Bureau Veritas

Registro Italiano Navale

Class NK

Prestabo / XL

Press connectors and pipelines made of non-alloy steel 1.0308

System description

The system is suitable for use in industrial and closed heating systems. It may not be used for potable water installations. Pipes and connectors are labelled with a red symbol "Not for potable water installations".
Prestabo components may only be used with components that belong to the system. The use of the system for applications other than those described must be approved by the Viega Service Center.
The press connectors are fitted with SC-Contur.

Operating conditions

Use with EPDM sealing element (factory-fitted)

- Water, closed system
  T_{max} = 110 °C p_{max} = 1.6 MPa
- Compressed air, dry and oil-free
  12 – 108.0 mm p_{max} = 1.6 MPa

Use with FKM sealing element (on site)

- Water
  T_{max} = 140 °C p_{max} = 1.6 MPa
- Compressed air, dry, oil-based
  12 – 108.0 mm p_{max} = 1.6 MPa

Fig. 20: Prestabo press connector 12 to 54 mm

Fig. 21: Prestabo XL press connector 64.0 to 108.0 mm

Technical data

Pipe material

- Pipe sizes 12 to 108.0 mm non-alloy steel, material no. 1.0308 according to DIN EN 10305-3, externally galvanised 8 to 15 µm (blue chromated)
- Pipe sizes 15 to 108.0 mm hot dip galvanised
- Pipe sizes 15 to 54 mm, polished and with 1.0 mm PP coating

Press connector material
Non-alloy steel, material no. 1.0308 according to DIN EN 10305-3, externally galvanised 8 to 15 µm (blue chromated)

Delivery state
6 m rods with red protective caps, tested for leak tightness, marked red as "Not approved for potable water"

Sealing elements
EPDM sealing element for operating temperatures ≤ 110 °C and operating pressures ≤ 1.6 MPa

Nominal dimensions [mm]
12/15/18/22/28/35/42/54/64.0/76.1/88.9/108.0

d x s [mm]	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]	Weight per 6 m rod [kg]
12 x 1.2	0.07	0.32	1.9
15 x 1.2	0.13	0.41	2.5
18 x 1.2	0.19	0.50	3.0
22 x 1.5	0.28	0.80	4.6
28 x 1.5	0.49	1.00	5.9
35 x 1.5	0.80	1.20	7.4
42 x 1.5	1.19	1.50	9.0
54 x 1.5	2.04	2.00	11.7
64.0 x 2.0	2.83	3.06	18.3
76.1 x 2.0	4.08	3.66	21.9
88.9 x 2.0	5.66	4.29	25.7
108.0 x 2.0	8.49	5.23	31.4

Tab. 12: Pipe key data material no. 1.0308 and hot dip galvanised

d x s [mm]	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]	Weight per 6 m rod [kg]
17 x 2.2	0.13	0.45	2.7
20 x 2.2	0.19	0.60	3.3
24 x 2.5	0.28	0.82	4.9
30 x 2.5	0.49	1.10	6.4
37 x 2.5	0.80	1.30	8.1
44 x 2.5	1.19	1.60	9.7
56 x 2.5	2.04	2.10	12.6

Tab. 13: Pipe key data Prestabo pipe – PP coated

Prestabo sprinkler

Press connectors and pipelines steel
In addition to this information, the section "Fire extinguishing systems" must be noted!

System description

The system is approved for use in sprinkler systems in the application areas described below.
Components

- Viega steel pipe, material 1.0215, hot dip galvanised inside and outside according to DIN EN 10305
- Prestabo press connector, material 1.0308, hot dip galvanised externally

The execution regulations acc. to VdS CEA 4001 as well as the requirements from the VdS approval apply. Systems must be mounted by specialist companies using original Prestabo sprinkler parts and the instructions for use delivered with the products.
Permitted areas of application

- Fire extinguishing systems wet for the protection of lower risks in Class LH, OH1 to OH3 and OH4, limited to use in exhibition halls, cinemas, theatres and concert halls
- Brand and distributor pipe systems
  Operating pressures acc. to the "Operating pressures" table below

Non-permitted use

- Drinking water and heating installations
- Extinguishing water with additives
- Extinguishing water with anti-corrosion agents

Fig. 22: Extinguishing water pipeline with sprinkler head

Fig. 23: Marking on press connector and pipe

Technical data

Pipes
Viega Prestabo pipe – material no. 1.0215, hot dip galvanised, zinc layer thickness >20 µm

Delivery state
Pipe lengths 6 m

Press connectors
Press connector – material no. 1.0308 according to DIN EN 10305-3, externally galvanised, with a zinc layer thickness of 8 to 15 µm (blue chromated), all sizes with SC-Contur

Nominal dimensions [mm]
22/28/35/42/54/64.0/76.1/88.9/108.0

d x s [mm]	Size	Maximum operating pressure [MPa]	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]
22 x 1.5	Standard	1.6	0.28	0.80
28 x 1.5			0.49	1.00
35 x 1.5			0.80	1.20
42 x 1.5			1.19	1.50
54 x 1.5			2.04	2.00
64.0 x 2.0	XL		2.83	3.06
76.1 x 2.0			4.08	3.66
88.9 x 2.0		1.25	5.66	4.29
108.0 x 2.0		1.0	8.49	5.23

Tab. 14: Technical data Prestabo pipes

Mounting

Transport and storage
To ensure the impeccable quality of our products, the following points should be observed during transport and storage:

- Press connectors
  Do not remove press connectors and their accessories from their original packaging until directly before use.
- Pipes
  - Keep pipe ends sealed with protective caps during storage and transport and do not remove until use
  - Avoid surface damage
  - Do not store directly of raw ceilings or rough surfaces

- Do not pull the pipes over the sill during transport
- Do not stick any protective foils or labels to the surfaces.
- Only clean the surfaces with suitable cleaning agents

Shortening of the pipes

The following general rules must be observed when installing Prestabo sprinkler pipes

- Only use pipe cutters, fine-toothed hacksaws or electrical saws to cut pipes to length – the use of angle grinders and flame cutters is not permitted.
- Only use cutting tools and agents which are suitable for the pipe material.
- After cutting, deburr the inside and outside of the pipes.

Bending of pipes

The pipes can be bent cold using suitable, commercially available bending machines. Additional heating up with a flame before bending (warm bending) changes the material properties and is thus not permitted. Minimum bending radius: $R_{min} \geq 3.5 \times$ pipe diameter.

Creation of the press connection

The mounting rules for using Viega press connectors apply. For details on this see the instructions for use for the products and in the Viega practice manual.

Z dimensions

Details on the installation dimensions on the Viega homepage in the download center at "www.viega.com".

Megapress

System description

Intended use

The Megapress/Megapress S system is suitable for the installation of heating, cooling, and industrial systems in connection with steel pipes according to (see pipe overview):

- DIN EN 10255
- DIN EN 10220/DIN EN 10216-1
- DIN EN 10220/DIN EN 10217-1

Furthermore, Megapress can be used in sprinkler systems according to VdS CEA 4001 and the specifications according to the respective approval G 414021. In addition to this information, the section “Fire extinguishing systems” must be noted!

The Megapress system is not suitable

- For use in potable water installations and other open systems – Components must be marked with symbol “Not for potable water installations”
- For combustible gases in acc. with DVGW worksheet G 260
- For local and district heating pipelines in the soil

Megapress connectors may only be used with components that belong to the system. The use of the system for applications other than those described must be approved by the Viega Service Center. Press connectors leak visibly when not pressed. Do a leakage test before commissioning.

Operating conditions

- Water, closed system
  - operating temperature $T_{max} \leq 110\,°C$ (EPDM)
  - operating temperature $T_{max} \leq 140\,°C$ (FKM)
  - operating pressure $p_{max} \leq 1.6\,MPa$ (16 bar)
- Compressed air, dry and oil-free
  - operating pressure $p_{max} \leq 1.6\,MPa$ (16 bar)

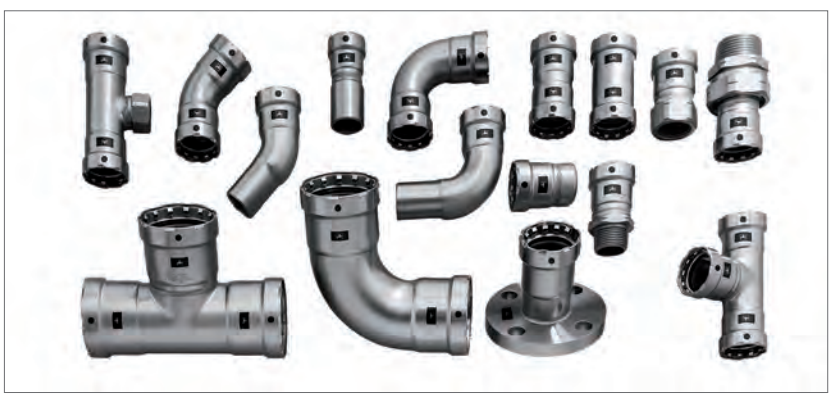


Fig. 24: Megapress product selection

Technical data

Pipe material

Steel pipes – seamless and with seam heat sealing: black, galvanised, industrially painted or powder-coated according to

- DIN EN 10255
- DIN EN 10216-1
- DIN EN 10217-1
- DIN EN 10220

For use in sprinkler systems according to VdS CEA 4001, the following pipe wall thicknesses must be observed:

inch (DN)	Minimum pipe wall thickness	Maximum pipe wall thicknesses
≤ D2 (DN50)	2.6 mm	3.3 mm
D2½ (DN65)	2.6 mm	4.5 mm
D3 (DN80)	2.9 mm	5.0 mm
D4 (DN100)	3.2 mm	5.4 mm

Tab. 15: Pipe wall thickness (acc. to VdS CEA 4001 Table 15.02)

Press connectors
Non-alloyed steel, material 1.0308, with high-quality zinc-nickel coating 3–5 µm

Sealing element
EPDM with integrally moulded sealing lip
for $T_{max} \leq 110\,°C$ and $p_{max} \leq 1.6\,MPa$
FKM with increased cross section,
for $T_{max} \leq 140\,°C$ and $p_{max} \leq 1.6\,MP$

Nominal dimensions
- Standard sizes [inches]
  - ⅜ (DN10), ½ (DN15), ¾ (DN20), 1 (DN25), 1¼ (DN32), 1½ (DN40), 2 (DN50)
- XL sizes [inches]
  - D2½ (DN65), D3 (DN80), D4 (DN100)
- Intermediate sizes [mm]
  - 44.5 (DN32), 57.0 (DN50)

Z dimensions
For the Z dimensions, refer to the respective product page in the online catalogue.

Certification
VdS – For sprinklers wet, dry, and wet/dry; TÜV; shipbuilding; various country approvals

Areas of application
Replacement for welded and threaded connections in new installations and repairs
- Closed heating and cooling circuits
- Industrial units – nitrogen etc.
- Compressed air systems
- Fire-fighting and sprinkler extinguisher systems

- Systems for technical gases (on request)

Features/benefits
- Fast processing without handling of gas cylinders or thread cutting machines – up to 60 % time saved when making the connections
- No fire hazard, no smoke emissions, damage, fire guards, cooling phases
- Zinc-nickel coating 3–5 µm – corrosion resistant, long service life
- Special sealing elements for rough pipe surfaces

Transition to other piping systems
The product portfolio comprises different adapters for the transition to other systems, e.g. to Prestabo or rolled-groove system as well as the special Megapress transition for potable water (cold) made of gunmetal or silicon bronze – model 4213.2.

Megapress press connectors
Megapress press connectors up to 2 inches are equipped with specifically designed EPDM sealing elements. Integrally moulded sealing lips with several sealing levels safely seal pipe surfaces, also those with slightly uneven surfaces or grooves. The Megapress press connectors are labelled with a black dot.

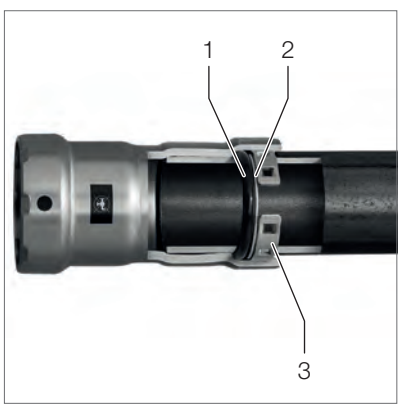


Fig. 25: Megapress press connectors


Fig. 26: Megapress sealing element

1 Profile sealing element
2 Separator ring
3 Cutting ring

Megapress S XL press connectors
Megapress S XL press connectors 2½, 3 and 4 inch are equipped with round sealing elements made of FKM. Thanks to their increased cross section, the round sealing elements used here have the same sealing effect as a profile sealing element. The Megapress S XL press connectors are labelled with a white dot.

Fig. 27: Megapress S XL press connectors

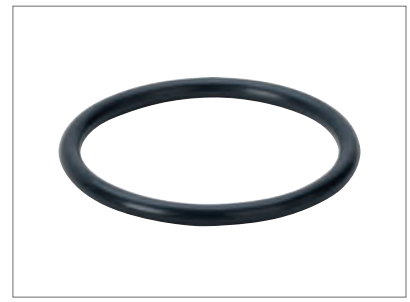


Fig. 28: Megapress S XL sealing element

Press connectors – leaking when unpressed
Megapress/Megapress S press connectors leak when not pressed. The „leaking when not pressed“ function is clearly marked by a dot at the bead. Inadvertently unpressed connections will be reliably detected when the system is filled.

- with water in a pressure range of 0.1 to 0.65 MPa,
- with air or inert gases in a pressure range of 22 to 0.3 MPa.

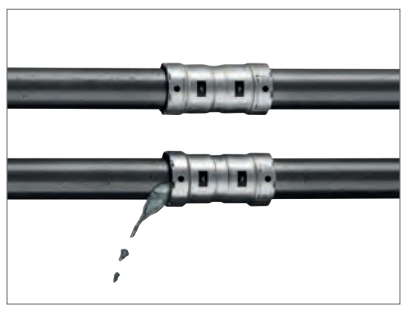


Fig. 29: Unpressed press connection (⅜–2 inch)

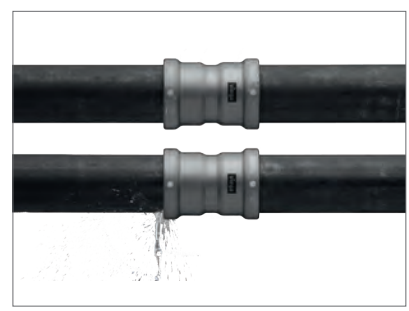


Fig. 30: Unpressed press connection (2½–4 inch)

Sliding couplings
The Megapress sliding coupling has no internal limit stop. For this reason, it is used mostly for repairing defective pipeline sections or for system extensions – e.g. for installing T-pieces in narrow spaces.

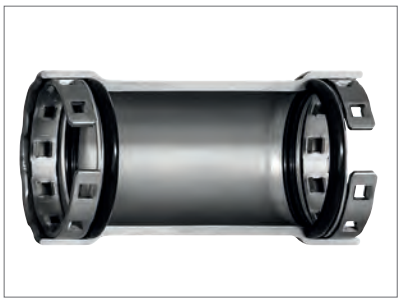


Fig. 31: Megapress sliding coupling (model 4215.5)

Fig. 32: Megapress sliding coupling (model 4215.4)

Megapress for steel pipes with 44.5 and 57.0 mm external diameter
The special Megapress adapters and reducing sleeves provide a fast transition to steel pipes of intermediate sizes with 44.5 and 57.0 mm external diameter. These press connectors can be pressed with the available Megapress press rings.

Fig. 33: Megapress adapter (model 4211.3)

Fig. 34: Megapress reducing sleeve (model 4215.7)

Special Megapress transition for potable water (cold)
The Megapress adapter model 4213.2 offers a simple means of connecting galvanised steel pipes (according to DIN EN 10240) directly to the Profipress, Sanpress and Sanpress Inox systems. The model has been approved according to DVGW Worksheet W 534 and is available in the sizes ½ inch x 15 mm up to 2 inch x 54 mm.
In addition to the Megapress application areas, the model can also be used in potable water pipelines (cold).
For installation, the flow rule must be observed.

Fig. 35: Megapress adapter made of gunmetal or silicon bronze
(model 4213.2)

Megapress press-in branch connector

The Megapress press-in branch connector can be used to make connections subsequently in existing steel pipe installations (1½, 2, 2½, 3, 4, 5 and 6 inch).

By means of the respective tool set, a hole is drilled in the steel pipe (not pressurised), and the Megapress press-in branch connector is then pressed in. This makes it possible for example to mount a thermometer quickly and without labour-intensive preparations to an existing steel pipe installation. The system will be operational immediately afterwards.

Making a threaded connection in just 4 steps

Fig. 36: A special holding device for guiding the drilling shaft is fastened to the steel pipe (1½ to 6 inches) by means of ring or fork spanner.

Fig. 37: Next, the hole is drilled by means of a commercially available drilling machine. The steel chips can be extracted by means of the vacuum cleaner nozzle. Afterwards, the holding device is removed again.

Fig. 38: Now, the press-in branch connector is pressed to the steel pipe by means of the press machine and the positioning aid. This is a fast and clean way of making the connection to the pipeline.

Fig. 39: The steel pipe connection Rp ¾ for thermometers, temperature sensors, manometers, drains or line connections is completed.

For detailed information on the areas of application, media, and suitable press machines, refer to the Viega instructions for use 573 184.

Transport and storage

Do not remove the Megapress system components from the packaging until immediately before use.

General mounting instructions

To guarantee the high quality of the Megapress system components, the following notes must be observed:

- Only use commercially available chloride-free sealants to seal the threads of the adapters to Viega press connections.
- When mounting components or pipeline sections with combined thread and press connections, always make the thread connection first.
- Always comply with the applicable accident prevention regulations (e.g. wear personal protective equipment).

Press tools

Megapress press connectors are pressed with special press jaws/press rings. The press rings/press jaws of the metal Viega press connector systems Profipress, Sanpress, Sanpress Inox and Prestabo cannot be used. We recommend using Viega press jaws, press rings and hinged adapter jaws according to Tab. 16.

Fig. 40: Megapress press tool up to 2 inches

Fig. 41: Megapress XL press tool as of 2½ inches

Press machines	Press jaws	Press rings	Set
Type 2	DN10–DN25 mod. 4299.9	DN15 and DN20 model 4296.1, with hinged adapter jaw Z1 model 2296.2	Press jaws DN15 to DN25 Press rings DN32 to DN50 Hinged adapter jaw Z2 model 4299.61
PT3 AH/EH		DN32 to DN50 model 4296.1, with hinged adapter jaw Z2 model 2296.2	
Pressgun 4/5		DN65 to DN100 model 4296.1XL, with Pressgun Press Booster model 4296.4XL	Press ring DN65 and Pressgun Press Booster model 4296.2XL
			Press rings DN80 and DN100 model 4296.5XL
Picco	DN10 and DN20 model 4284.9	DN15 and DN20 model 4296.1, with hinged adapter jaw P1 model 2496.1	Press jaws DN15 and DN20 Press rings DN15 and DN20 Hinged adapter jaw P1 model 4299.62
Pressgun Picco			

Tab. 16: Press tools – For Megapress press connectors

Press tools for intermediate sizes (44.5 mm and 57.0 mm)
The Megapress press connectors for the intermediate sizes are pressed with standard Megapress press rings.

External diameter [mm]	Press rings
44,5	DN40 (1 ½ inches), model 4296.1 with hinged adapter jaw Z2, model 2296.2
57.0	DN50 (2 inches), model 4296.1 with hinged adapter jaw Z2; model 2296.2

Tab. 17: Press tools for intermediate sizes

Fire extinguisher and sprinkler systems

(This section does not apply to the Megapress press-in branch connector)

For fire extinguishers and sprinkler systems, the following requirements must be observed:

- VdS CEA 4001
- Requirements and advisory notes in the respective VdS approval
- Country-specific requirements and regulations
- Tab. 18

Only black, galvanised or powder-coated steel pipes in acc. with the conditions of the VdS approval G 414021 are permitted in VdS conform sprinkler systems acc. to CEA 4001. For application in sprinkler systems according to VdS CEA 4001, the pipe wall thicknesses according to Tab. 18 must be observed. The distances and layout (bracket distances) for steel pipes acc. to VdS CEA 4001 Section 15.2 apply.

Permitted pressure	≤ DN65 1.6 MPa, DN80 1.25 and DN100 1.0 MPa		
Nominal widths	DN20 to DN100 (exception: 44.5 mm and 57.0 mm)		
Wall thickness (according to VdS CEA 4001 Table 15.02)	inch (DN)	Minimum pipe wall thickness	Maximum pipe wall thicknesses
	≤ D2 (DN50)	2.6 mm	3.3 mm
	D2½ (DN65)	2.6 mm	4.5 mm
	D3 (DN80)	2.9 mm	5.0 mm
	D4 (DN100)	3.2 mm	5.4 mm
Area of use (piping network)	**Wet sprinkler units** Piping network downstream of the alarm valve station **Dry sprinkler units** Piping network downstream of the alarm valve station		
Fixing intervals	In compliance with the regulations in VdS CEA 4001 section 15.2		
Extinguishing water additives	Generally not permitted; exceptions only with the manufacturer's permission and prior agreement of the VdS		

Tab. 18: Permitted pressure, nominal width and conditions of use on the basis of Table A. 1 in acc. with VdS 2100-26-2: 2012-04

All of the fire hazard classes in acc. with VdS CEA 4001 are covered by Megapress:

- Fire hazard class LH (light hazard)
- Fire hazard class OH 1 – 4 (ordinary hazard)
- Fire hazard class HHP 1 – 4 (extra hazard, production risks)
- Fire hazard class HHS 1 – 4 (extra hazard, storage risks)

Pipe overview

Megapress and Megapress S can be used to connect different steel pipes – such as black, galvanised, industrially painted, or coated pipes – in sizes ⅜ to 4 inches.

DIN EN 10255

DIN EN 10255 differentiates between heavy pipe series H and medium pipe series M and between pipe type L, L 1 and L 2. The different pipe series and pipe types comprise seamless pipes (S) and pipes welded along the longitudinal seam (W).

Steel pipes for Megapress / Megapress S-press connectors

DIN EN 10255 – Threaded pipe quality – Heavy series H and Medium series M

Thread size	Nominal width	Nominal external diameter	External diameter incl. coating		Pipe wall thickness	
					Heavy series H	Medium series M
[inch]	[DN]	[mm]	min. [mm]	max. [mm]	[mm]	[mm]
⅜	10	17.2	16.7	17.5	2.9	2.3
½	15	21.3	21.0	21.8	3.2	2.6
¾	20	26.9	26.5	27.3	3.2	2.6
1	25	33.7	33.3	34.2	4.0	3.2
1¼	32	42.4	42.0	42.9	4.0	3.2
1½	40	48.3	47.9	48.8	4.0	3.2
2	50	60.3	59.7	60.8	4.5	3.6
2½	65	76.1	75.3	76.6	4.5	3.6
3	80	88.9	88.0	89.5	5.0	4.0
4	100	114.3	113.1	115.0	5.4	4.5

Tab. 19: DIN EN 10255 – Threaded pipe quality – Heavy series H and Medium series M

DIN EN 10255 – Threaded pipe quality – pipe type L

Thread size	Nominal width	Nominal external diameter	External diameter incl. coating		Pipe wall thickness
[inch]	[DN]	[mm]	min. [mm]	max. [mm]	[mm]
⅜	10	17.2	16.7	17.4	2.0
½	15	21.3	21.0	21.7	2.3
¾	20	26.9	26.4	27.1	2.3
1	25	33.7	33.2	34.0	2.9
1¼	32	42.4	41.9	42.7	2.9
1½	40	48.3	47.8	48.6	2.9
2	50	60.3	59.6	60.7	3.2

Thread size	Nominal width	Nominal external diameter	External diameter incl. coating		Pipe wall thickness
[inch]	[DN]	[mm]	min. [mm]	max. [mm]	[mm]
2½	65	76.1	75.2	76.0	3.2
3	80	88.9	87.9	88.7	3.2
4	100	114.3	113.0	113.9	3.6

Tab. 20: DIN EN 10255 – Threaded pipe quality – pipe type L

DIN EN 10255 – Threaded pipe quality – pipe type L1

Thread size	Nominal width	Nominal external diameter	External diameter incl. coating		Pipe wall thickness
[inch]	[DN]	[mm]	min. [mm]	max. [mm]	[mm]
⅜	10	17.2	16.7	17.4	2.0
½	15	21.3	21.0	21.7	2.3
¾	20	26.9	26.4	27.1	2.3
1	25	33.7	33.2	34.0	2.9
1¼	32	42.4	41.9	42.7	2.9
1½	40	48.3	47.8	48.6	2.9
2	50	60.3	59.6	60.7	3.2
2½	65	76.1	75.2	76.3	3.2
3	80	88.9	87.9	89.4	3.6
4	100	114.3	113.0	114.9	4.0

Tab. 21: DIN EN 10255 – Threaded pipe quality – pipe type L1

DIN EN 10255 – Threaded pipe quality – pipe type L2

Thread size	Nominal width	Nominal external diameter	External diameter incl. coating		Pipe wall thickness
[inch]	[DN]	[mm]	min.[mm]	max. [mm]	[mm]
⅜	10	17.2	16.7	17.1	1.8
½	15	21.3	21.0	21.4	2.0
¾	20	26.9	26.4	26.9	2.3
1	25	33.7	33.2	33.8	2.6
1¼	32	42.4	41.9	42.5	2.6
1½	40	48.3	47.8	48.4	2.9
2	50	60.3	59.6	60.2	2.9
2½	65	76.1	75.2	76.0	3.2
3	80	88.9	87.9	88.7	3.2
4	100	114.3	113.0	113.9	3.6

Tab. 22: DIN EN 10255 – Threaded pipe quality – pipe type L2

Steel pipes for Megapress press-in branch connector

Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 – Heavy series H and Medium series M

Art. no. Press-in branch connector Rp ¾	For pipe dimensions [inch]	Nominal external diameter [mm]	External diameter min. [mm]	External diameter max. [mm]	Pipe wall thickness Heavy series H [mm]	Pipe wall thickness Medium series M [mm]
731 168	1½	48.3	47.9	48.8	4.0	3.2
731 175	2	60.3	59.7	60.8	4.5	3.6
731 182	2½	76.1	75.3	76.6	4.5	3.6
731 199	3	88.9	88.0	89.5	5.0	4.0
731 205	4	114.3	113.1	115.0	5.4	4.5
731 212	5	139.7	138.5	140.8	5.4	5.0
731 229	6	165.1	163.9	166.5	5.4	5.0

Tab. 23: Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 – Heavy series H and Medium series M

Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 – pipe type L

Art. no. Press-in branch connector Rp ¾	For pipe dimensions [inch]	Nominal external diameter [mm]	External diameter min. [mm]	External diameter max. [mm]	Pipe wall thickness [mm]
731 168	1½	48.3	47.8	48.6	2.9
731 175	2	60.3	59.6	60.7	3.2
731 182	2½	76.1	75.2	76.0	3.2
731 199	3	88.9	87.9	88.7	3.2
731 205	4	114.3	113.0	113.9	3.6
731 212	5	139.7	138.5	140.8	4.5
731 229	6	165.1	163.9	166.5	4.5

Tab. 24: Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 – pipe type L

Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 pipe type L1

Art. no. Press-in branch connector Rp ¾	For pipe dimensions [inch]	Nominal external diameter [mm]	External diameter min. [mm]	External diameter max. [mm]	Pipe wall thickness [mm]
731 168	1½	48.3	47.8	48.6	2.9
731 175	2	60.3	59.6	60.7	3.2
731 182	2½	76.1	75.2	76.3	3.2
731 199	3	88.9	87.9	89.4	3.6
731 205	4	114.3	113.0	114.9	4.0

Tab. 25: Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 pipe type L1

Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 pipe type L2

Art. no. Press-in branch connector Rp ¾	For pipe dimensions [inch]	Nominal external diameter [mm]	External diameter min. [mm]	External diameter max. [mm]	Pipe wall thickness [mm]
731 168	1½	48.3	47.8	48.4	2.9
731 175	2	60.3	59.6	60.2	2.9
731 182	2½	76.1	75.2	76.0	3.2
731 199	3	88.9	87.9	88.7	3.2
731 205	4	114.3	113.0	113.9	3.6

Tab. 26: Press-in branch connector for steel pipe – threaded pipe quality DIN EN 10255 pipe type L2

DIN EN 10220/DIN EN 10216-1 and DIN EN 10220/DIN EN 10217-1
DIN EN 10220 differentiates between pipe series 1, 2 and 3.
The standard recommends using installation pipes of pipe series 1 as pipe series 2 and 3 are either not or not always available in practice.
Pipe series 1 comprises seamless pipes (S) and pipes welded along the longitudinal seam (W).

Steel pipes for Megapress/Megapress S-press connectors

DIN EN 10220/DIN EN 10216-1, DIN EN 10220/DIN EN 10217-1 Boiler pipe quality – pipe series 1, 2, and 3

Thread size	Nominal width	Nominal external diameter	External diameter incl. coating		Possible pipe wall thicknesses
[inch]	[DN]	[mm]	min. [mm]	max. [mm]	[mm]
⅜	10	17.2	16.7	17.7	from 1.4 to 4.5
½	15	21.3	21.0	21.8	from 1.4 to 5.0
¾	20	26.9	26.5	27.3	from 1.4 to 8.0
1	25	33.7	33.3	34.2	from 1.4 to 8.8
1¼	32	42.4	42.0	42.9	from 1.4 to 10.0
-	32	44.5	44.0	45.0	from 1.4 to 12.5
1½	40	48.3	47.9	48.8	from 1.4 to 12.5
-	50	57.0	56.4	57.6	from 1.4 to 14.2
2	50	60.3	59.7	60.9	from 1.4 to 16.0
2½	65	76.1	75.3	76.9	from 1.4 to 20.0
3	80	88.9	88.0	89.8	from 1.4 to 25.0
4	100	114.3	113.2	115.4	from 1.4 to 32.0

Tab. 27: DIN EN 10220/DIN EN 10216-1, DIN EN 10220/DIN EN 10217-1 Boiler pipe quality – pipe series 1, 2, and 3

Steel pipes for Megapress press-in branch connector

DIN EN 10220/DIN EN 10216-1, DIN EN 10220/DIN EN 10217-1 Boiler pipe quality – pipe series 1

Art. no. Press-in branch connector Rp ¾	For pipe dimensions [inch]	Nominal external diameter [mm]	External diameter		Pipe wall thickness	
			min. [mm]	max. [mm]	min. [mm]	max. [mm]
731 168	1½	48.3	47.9	48.8	2.3	4.0
731 175	2	60.3	59.7	60.9	2.3	4.5
731 182	2½	76.1	75.3	76.9	2.6	4.5
731 199	3	88.9	88.0	89.8	2.6	5.0
731 205	4	114.3	113.2	115.4	2.6	5.4
731 212	5	139.7	138.5	140.8	2.9	5.4
731 229	6	168.3	163.9	166.8	2.9	5.4

Tab. 28: DIN EN 10220/DIN EN 10216-1, DIN EN 10220/DIN EN 10217-1 Boiler pipe quality – pipe series 1

Mounting

Cut to length

Under consideration of the pipe coating, the steel pipes can be cut with the following tools:

- pipe cutter
- fine-toothed saw
- chopsaw – low cutting speed
- angle-grinder

After cutting, deburr the inside and outside of the pipes.

Preparing the pipe ends for the press connection

The Megapress system is suitable for use with black, galvanised, industrially painted, or powder-coated steel pipes.
As a precondition for making technically faultless press connections, the pipes must be free of damage and deformations and the pipe ends must be sufficiently smooth and clean, as well as free of loose dirt and rust particles.
Do not press on embossed pipe markings.

Requirements in pipe ends

- Correctly cut to length
- Inside and outside of pipe wall free of burrs
- Cross section round, without deformations, e.g. caused by vices
- Minimum distance to welding seams and bending points must be 3 x D – however at least 100 mm

- For the installation of Megapress press connectors, the minimum external diameter of inserted pipes according to Tab. 19 – Tab. 22 and Tab. 27 must not be below this minimum.

Requirements in pipe surfaces

- Smooth and even – without damage from vices or thread cutters or similar
- If the pipe has an industrially applied coating, the coating must not be damaged when cutting the pipe (e.g. pipe cutter). Damaged or scratched coating must be previously removed in the area of the insertion depth
- Free of grease and oil
- Free of loose dirt and rust particles and unevenly (manually) applied coats
- For the Megapress press-in branch connector, the thickness of the coat on the installation pipe must not exceed 300 µm for industrially painted pipes.

Examples

As long as they are free from dirt, smooth, firm, even and undamaged, the following pipe surfaces are suitable for the production of press connections without further treatment:

black	Fig. 42
galvanised	Fig. 43
industrially painted/powder coated	Fig. 44

Fig. 42: Black, uncoated

Fig. 43: Galvanised

Fig. 44: Powder-coated

Before making the press connections, pipe surfaces must be treated around the press connections if they exhibit the following characteristics

- Excessive coat thickness on the pipe (mounting without force not possible any more), max. external diameter is exceeded, see Tab. 19 – Tab. 21 and Tab. 27
- Unevenly applied layers of paint, see Fig. 45
- Bumps, damage, grooves, corrosion or loose adhesions, see Fig. 46

Do not press on embossed pipe markings (Fig. 47).

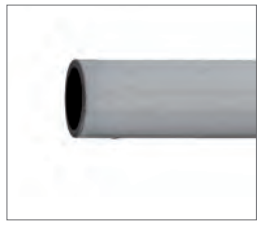


Fig. 45: Unevenly painted

Fig. 46: Corroded

Fig. 47: Embossed

The following are examples of suitable tools for the work:

Wire brush	Fig. 48
Cleaning fleece/sanding paper	Fig. 49
Angle grinder with serrated washer	Fig. 50

Fig. 48: Wire brush

Fig. 49: Cleaning fleece / sanding paper

Fig. 50: Angle-grinder

After the treatment, the quality of the pipe surface should be as shown in Fig. 51. The minimum external diameter of inserted pipes according to Tab. 19 – Tab. 22 and Tab. 27 must not be below this minimum.

Fig. 51: Treated pipe surface

Corrosion protection/coat

In systems where complete corrosion protection is required (e.g. cooling systems), parts of the processed pipe surface that are uncovered after pressing must subsequently have suitable corrosion protection applied.

Pipe fastener

The general rules of fixing technology apply, e.g.

- No further pipelines must be attached to existing pipeline installations.
- Use of pipe hooks is not permitted.

- Consider the thermal expansion – plan for fixed and gliding points.

Ø external [mm]	Nominal width [DN]	[inch]	fixing interval [m] According to the manufacturer's information	According to VdS CEA 4001
17.2	10	⅜	2.25	-
21.3	15	½	2.75	
26.9	20	¾	3.00	4.00
33,7	25	1	3,50	
42.4	32	1 ¼	3.75	
48.3	40	1 ½	4.25	
60.3	50	2	4.75	
76.1	65	2 ½	5.50	
88.9	80	3	6.00	
114.3	100	4	6.00	

Tab. 29: Fixing intervals

Protection against external corrosion/insulation

A high-quality zinc-nickel coating protects the press connectors optimally against corrosion - e.g. when condensation water forms in cooling systems. The pipes must be equipped with suitable corrosion protection; observe the manufacturer‘s information.
Pipes and connectors must be insulated according to the general rules of engineering.

Commissioning

A pressure test must be carried out before commissioning the system, the results thereof must be documented.
Procedure

- Completely fill the system with the test medium, such as inert gases/filtered drinking water. If the system is not put into operation immediately after the pressure test, the pressure test must be performed with oil-free compressed air/inert gases.
- Perform the pressure test according to the generally recognised rules of engineering – in sprinkler systems note VdS CEA 4001, section 17.
- Document the results of the pressure test in a log.
- Have an authorized expert sign the log and provide it to the customer.

Protection from internal corrosion – three-phase boundary

Corrosion can occur in the area of the three-phase boundary from water, material and air. This corrosion can be prevented if the system remains completely full of water after its first filling and bleeding. If the installation is not to be commissioned immediately, it is recommended that the pressure and leakage test is carried out using air or inert gases.

Use in cooling water systems

The Viega Prestabo press connector system, in combination with externally galvanised pipes, can be used in all closed cooling water systems in which no oxygenation is possible during operation.
Due to the operating conditions in cooling water systems, it may be necessary to add anti-freeze to the carrier medium. The standard sealing elements made of EPDM can be used up to a glycol content of 50% of the total water content. Viega hot dip galvanised pipes are not suitable for use in this case.
In acc. with DIN EN 14 868 (2005-11) re-filling a system does not normally lead to significant oxygenation. However, the oxygenation can lead to damage (corrosion) in the system, if the circulating water is regularly replaced due to losses or, for example due to automatic topping up, considerable quantities of fresh water were added.
Based on the VDI Directive 2 035 Tab. 1 the oxygen content of low-salt water should be below 0.1 mg/l, and for salty water below 0.02 mg/l. Complete external corrosion protection, which reliably prevents corrosive influences, must be applied when using in cooling circuits. When doing so, observe the manufacturers' application instructions, DIN 50 929 as well as AGI Worksheet Q 151.

Protection against external corrosion

Prestabo pipes and the connectors are protected by a thin galvanic zinc-plating coat. This galvanisation protects against moist surroundings, however not against external corrosion on a permanent basis.
The system is intended for installation in warm and dry atmospheres. The components should not normally come into contact with water when properly installed and used as intended. If, however, constant contact with moisture occurs, then it may lead to external corrosion of the system. Constant dampness on the pipe occurs due to the following conditions, e.g.:

- Due to condensation or precipitation during the construction phase
- Condensation, e. g. when used in cooling circuits
- Cleaning or splash water as well as wastewater through defect floor seals etc.
- When water reaches the pipeline installation in a non-intended way, e.g. due to a construction defect or water damage in the building

The following measures should be observed to protect the Prestabo system from external corrosion:

- Lay the pipelines outside of the areas at risk of dampness.
- Avoid contact with corrosive building materials, e. g. filler or levelling screed.

- Use waterproof separating foil in the floor construction to protect the laid pipelines against possible dampness, e. g. screed dampness. Tho overlapping foil overlaps must be sealed tightly.
- Use closed-cell insulating hoses and seal properly. Take particular care to stick all of the abutting ends and cut edges together. However, the measures are no substitute for potentially necessary and additional corrosion protection.
- In the case of installations, e.g. in industrial areas, which are contaminated with aggressive ambient air, one should observe the internal factory standards.

Corrosion due to cleaning water

In areas where daily cleaning of the floor is deemed necessary, e.g. in hospitals, exterior corrosion can also be caused by cleaning water and cleaning agent coming into contact with visible radiator connection lines that protrude from the floor.
The water and cleaning agents can seep through leaky joints between pipelines and the floor covering into the insulation. It is unable to escape and this leads to constant dampness around the pipes, which leads to external corrosion. Disinfectant can also have a corrosive effect on pipelines.
Recommended measures to protect against corrosion due to cleaning water

- Favour radiator connections out of the wall.
- Use plastic coated Prestabo pipes for connections coming out of the floor.
- Seal joints between pipeline and floor covering properly. Silicone joints must be regularly maintained.

We recommend to use the PP coated Prestabo pipe (model 1104) for laying the Prestabo system in the floor area or for concealed installation.
The press connectors and pipe ends must be treated with a corrosion prevention agent — e.g. Denso Densolen ET 100, to ensure constant protection against corrosion. The relevant processing guidelines must be observed, whilst doing so.

Fixing intervals

The maximum fixing distance for pipelines in sprinkler systems acc. to VdS CEA 4001 is 2.0 m for all sizes. Under certain circumstances, the intervals can be increased to 3.0 m. For details on this see VdS CEA 4001 point 15.2.2.

Commissioning

Before commissioning the system, a pressure test is to be performed by an authorised specialist – the result of this is to be documented.
Procedural steps

- Fill the system fully with filtered potable water.
- Carry out a pressure test according to VdS CEA 4001, section 17.
- Document the results of the pressure test in a log.
- Hand over the record which has been signed by the specialist to the client.

General mounting instructions

Bending of pipes

Stainless steel and copper pipes must be bent with suitable machines. The minimum bending radius for Sanpress pipes is R ≥ 3.5 x d.
The following applies as a rule

- The expansion bends must be straight and at least 50 mm in order to create a correct press connection.
- Bending stresses between elbows and press connectors are to be avoided.
- Compatibility with pipe materials is to be checked before using bending sprays.
- Stainless steel pipes may only be bent when cold. Heat treatment changes the material properties and thus must be avoided.

Flange connections

With metal press connector systems a direct transition to flange connections is possible with press connections in sizes 28 to 108.0 mm.
For Sanpress Inox flanges made of stainless steel with press connections in sizes 22 to 108.0 mm are available.
Seals with flange connections can be selected according to the requirements from AFM34 or asbestos-free sealing material.

Sanpress Inox
Made from stainless steel 1.4401

22 to 54 mm	model 2359
64.0 to 108.0 mm	model 2359XL

Fig. 52: Sanpress Inox fixed flange

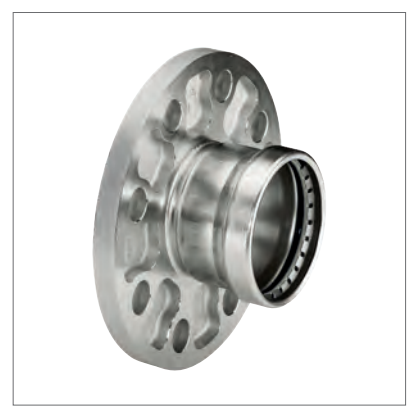


Fig. 53: Sanpress Inox XL fixed flange

Sanpress
Made of steel, black powder-coated, with press connection made of gunmetal or silicon bronze

28 to 54 mm	model 2259.5
76.1 to 108.0 mm	model 2259.5XL

Fig. 54: Sanpress loose flange

Fig. 55: Sanpress XL loose flange

Press connections

Stainless steel, copper, Prestabo pipes 12 to 54 mm
Stainless steel, steel and copper pipes are connected simply and safely with the Viega press connections.
Required tools

- Pipe cutter or fine-toothed steel saw
- Deburrer and coloured pen for marking the insertion depth
- Suitable press machine with press jaw

Fig. 56: The pipe should be cut to length properly.

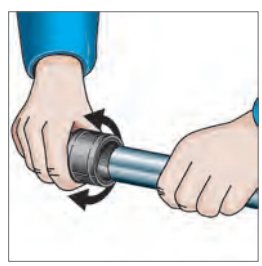


Fig. 57: Deburr the inside and outside of the pipe.

Fig. 58: Ensure that the sealing element is properly fitted.

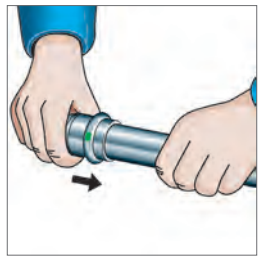


Fig. 59: Push the press connector onto the pipe as far as it will go.

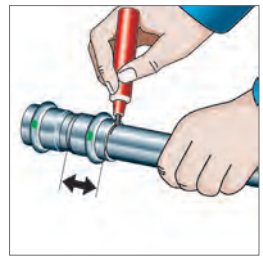


Fig. 60: Mark the insertion depth.

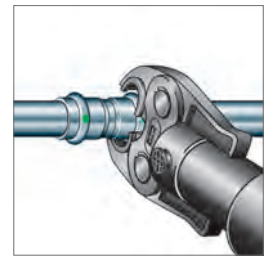


Fig. 61:
– Open press jaw and place at a right-angle onto the connector.
– Check insertion depth.
– Start pressing.

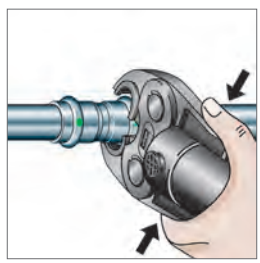


Fig. 62: Once pressing is complete, open the press jaw.

Sanpress XL 76.1 to 108.0 mm

Stainless steel pipes are connected simply and safely using Viega press connections.

Required tools

- Pipe cutter or fine-toothed steel saw – the use of angle grinders is not permitted.
- deburrer and coloured pen for marking
- Suitable press machine
- Suitable sized press chain and adapter jaw

Place the adapter jaw onto the press machine and push the retaining bolt in until it clicks into place.

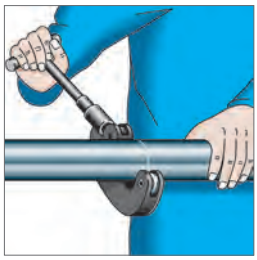


Fig. 63: The pipe should be cut to length properly.

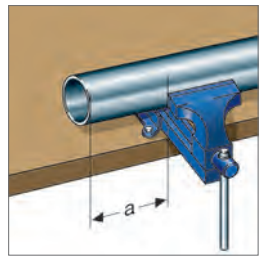


Fig. 64: Caution when clamping!
The pipe ends must be absolutely round.

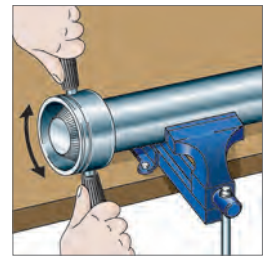


Fig. 65: Deburr the inside and outside of the pipe.

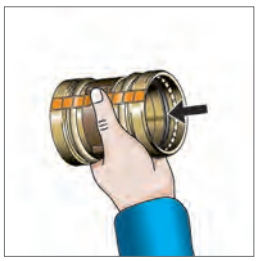


Fig. 66: Mark the insertion depth.
Ø 76.1 mm = 55 mm
Ø 88.9 mm = 55 mm
Ø 108.0 mm = 65 mm

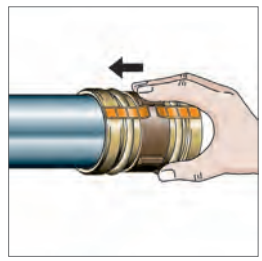


Fig. 67: Ensure the proper seat of sealing element and cutting ring.

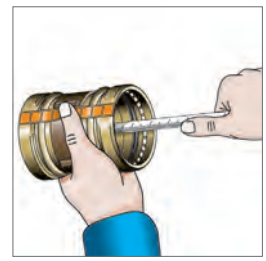


Fig. 68: Push the press connector up to the marked insertion depth on the pipe.

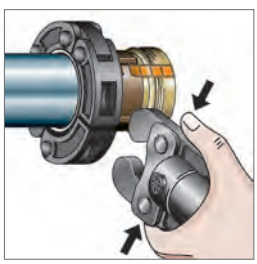


Fig. 69: Position the press chain on the connector.
– Open the adapter jaw and engage in the seat of the press chain.

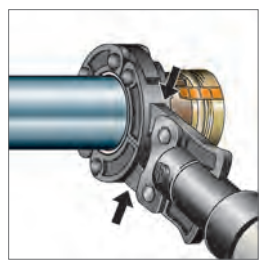


Fig. 70: Attach the press machine and perform pressing.

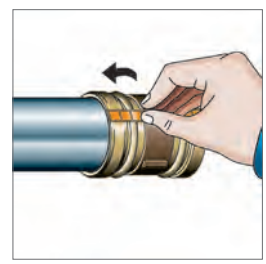


Fig. 71: Remove the checking strip – the connection is marked as having been pressed.

Sanpress Inox XL, Profipress XL, Prestabo XL 64.0 to 108.0 mm

Differences to using Sanpress XL press connectors (page 22)

- Different insertion depths see Fig. 75
- Use of press rings instead of press chains see Fig. 78

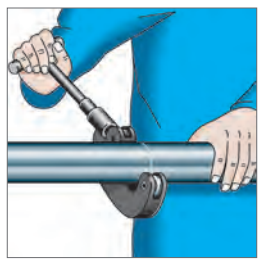


Fig. 72: The pipe should be cut to length properly.

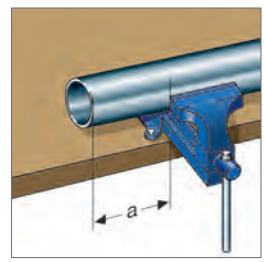


Fig. 73: Caution when clamping! - The pipe ends must be absolutely round.

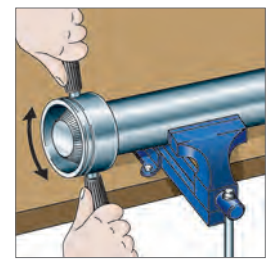


Fig. 74: Deburr the inside and outside of the pipe.

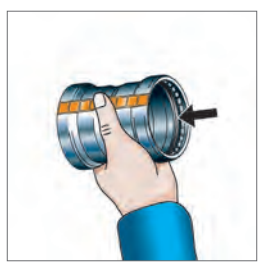


Fig. 75: Mark the insertion depth.
Dia. 64.0 mm = 43 mm
Dia. 76.1 mm = 50 mm
Dia. 88.9 mm = 50 mm
Dia. 108.0 mm = 65 mm

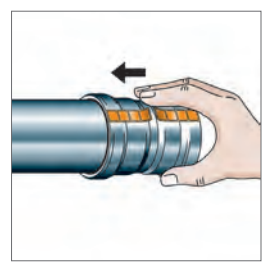


Fig. 76: Ensure the proper seat of sealing element and cutting ring.

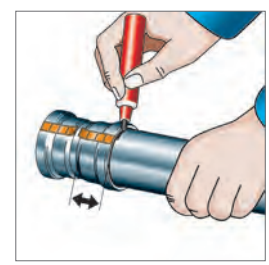


Fig. 77: Push the press connector up to the marked insertion depth on the pipe.

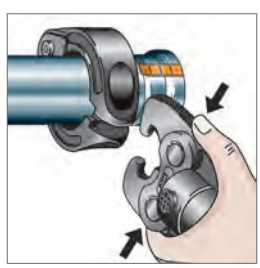


Fig. 78: Place the press ring on the connector – open the hinged adapter jaw and place in the recesses of the press ring

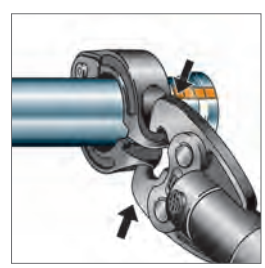


Fig. 79: Attach the press machine and perform pressing.

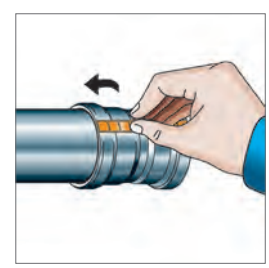


Fig. 80: Remove the checking strip – the connection is marked as having been pressed.

Megapress – Creation of the press connection up to 2 inches

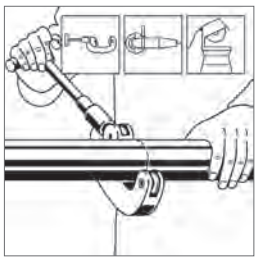


Fig. 81: Cut the steel pipe properly and at a right angle using a pipe cutter, angle grinder or fine-toothed hacksaw. Do not use a flame cutter.

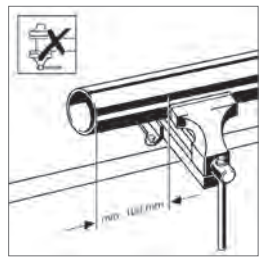


Fig. 82: Proceed with caution when clamping the pipe – avoid deformation of the pipe end.

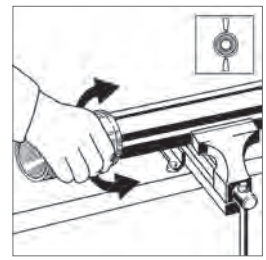


Fig. 83: Use a deburrer to deburr the inside and outside of the pipe – up to DN40 use model 2292.2, DN50 use model 2292.4 XL

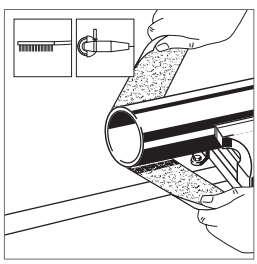


Fig. 84: With the help of a wire brush, sanding paper or an angle grinder with a fan washer, remove loose dirt and rust particles from the pressing area.

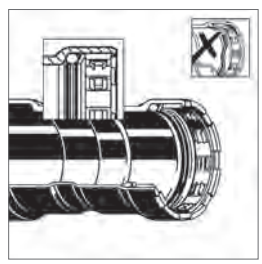


Fig. 85: Ensure the proper seat of sealing element, separator ring and cutting ring.

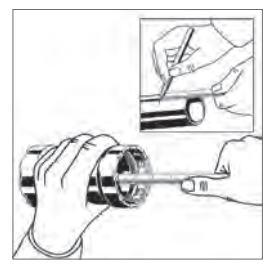


Fig. 86: Measure the insertion depth and mark it on the pipe.

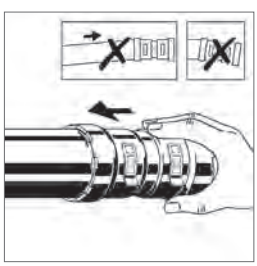


Fig. 87: Push the press connector onto the pipe as far as it will go. Do not tilt the press connector.

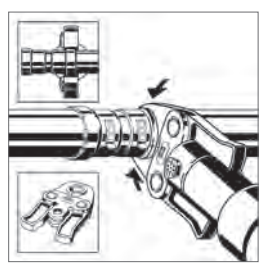


Fig. 88: Place the Megapress press jaw (≤ DN25) around the press connector. Ensure that it is properly fitted. Carry out the pressing until the press jaw is completely closed.

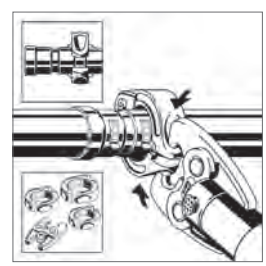


Fig. 89: Place the Megapress press ring around the press connector. Ensure that it is properly fitted. Carry out the pressing using the adapter jaw until the press ring is completely closed.

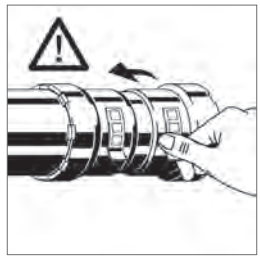


Fig. 90: Remove the control label to mark the connector as “pressed”.

Megapress – Creation of the press connection from 2½ to 4 inches

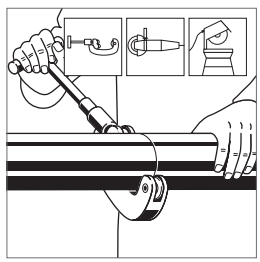


Fig. 91: Cut the steel pipe properly and at a right angle using a pipe cutter, angle grinder or fine-toothed hacksaw. Do not use a flame cutter.

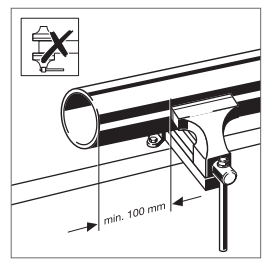


Fig. 92: Proceed with caution when clamping the pipe – avoid deformation of the pipe end.

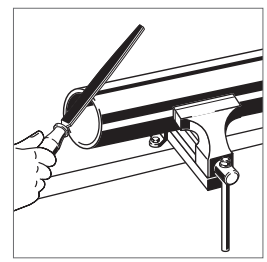


Fig. 93: Properly deburr the inside and outside of the pipe.

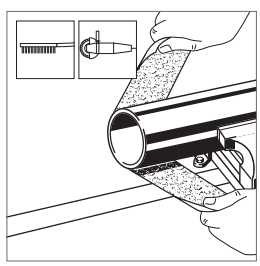


Fig. 94: With the help of a wire brush, sanding paper or an angle grinder with a fan washer, remove loose dirt and rust particles from the pressing area.

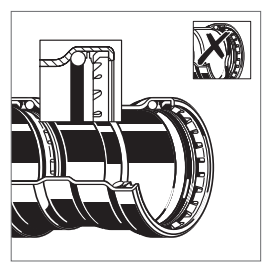


Fig. 95: Ensure the proper seat of sealing element, separator ring and cutting ring.

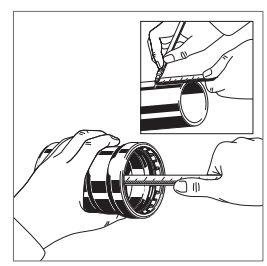


Fig. 96: Measure the insertion depth and mark it on the pipe.

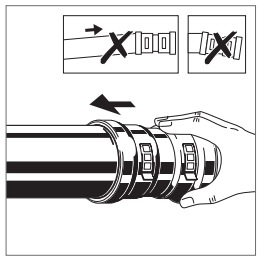


Fig. 97: Push the press connector onto the pipe as far as it will go. Do not tilt the press connector.

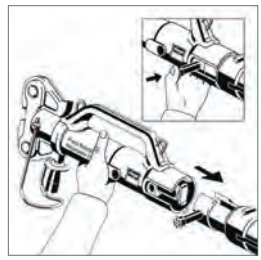


Fig. 98: Place the Press Booster in the press machine and lock in using the retaining bolt.

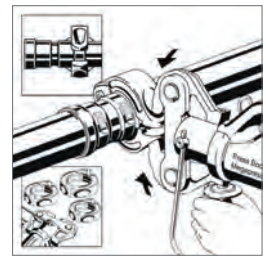


Fig. 99: Place the Megapress XL press ring around the press connector. Observe the proper fit of the press ring. Trigger pressing **twice**! If necessary, carry out a reset stroke.

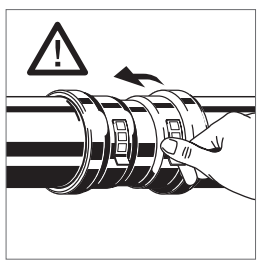


Fig. 100: Remove the control label to mark the connector as “pressed”.

Megapress – Insertion depths

Measure the required insertion depths at the press connection. The following insertion depths must be observed:

Dimension		Minimum insertion depth
[inch]	[mm]	[mm]
⅜	17.2	24
½	21.3	27
¾	26.9	29
1	33.7	34
1¼	42.4	46
-	44.5	48
1½	48.3	48
-	57.0	48
2	60.3	50
2½	76.1	46
3	88.9	59
4	114.3	80

Tab. 30: Insertion depths

Space requirement when pressing

Pipe sizes 12 to 54 mm – with press jaw
For technically fault-free pressing, some space is required for placing the press machine. See the following tables for information on the minimum space required in different installation situations.

Note:
Note the different values for mains- and battery-operated devices.

Pressing between pipes

Pressgun 4B (battery) / 4E / Pressgun 5

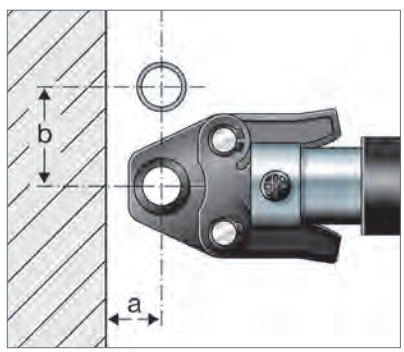


Fig. 101: Pressing between pipes – Pressgun 4B (battery) / 4E / Pressgun 5

d [mm]	a [mm]	b [mm]
12	20	50
15	20	50
18	20	55
22	25	60
28	25	70
35	30	85
42	45	100
54	50	115

Tab. 31: Pressing between pipes – space requirement Pressgun 4B (battery) / 4E / Pressgun 5

Pressgun Picco

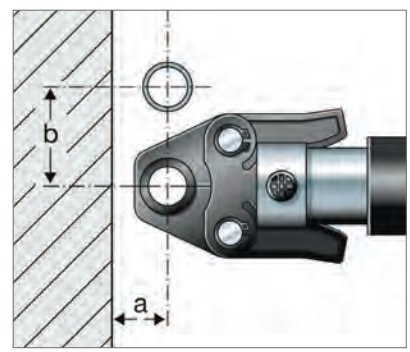


Fig. 102: Pressing between pipes – Pressgun Picco

d [mm]	a [mm]	b [mm]
12	25	55
15	25	60
18	25	60
22	25	65
28	25	65
35	30	65

Tab. 32: Pressing between pipes – space requirement Pressgun Picco

Pressing between pipe and wall

Pressgun 4B (battery) / 4E / Pressgun 5

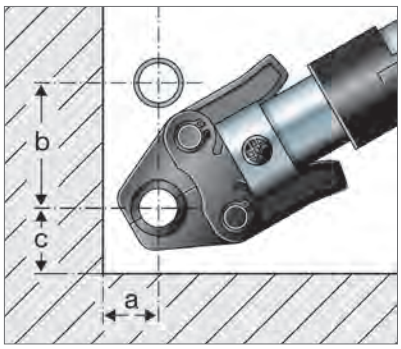


Fig. 103: Pressing between pipe and wall – Pressgun 4B (battery) / 4E / Pressgun 5

d [mm]	a [mm]	b [mm]	c [mm]
12	25	65	40
15	25	65	
18	25	75	
22	30	80	
28	30	85	
35	50	95	
42	50	115	
54	55	140	

Tab. 33: Pressing between pipe and wall – space requirement Pressgun 4B (battery) / 4E / Pressgun 5

Pressgun Picco

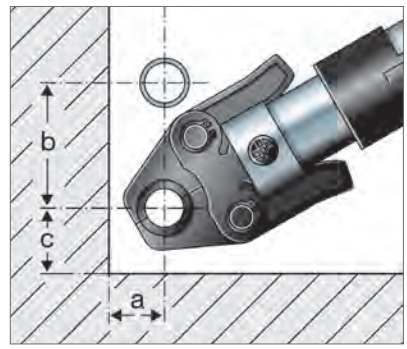
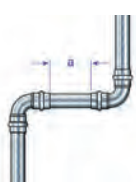


Fig. 104: Pressing between pipe and wall – Pressgun Picco

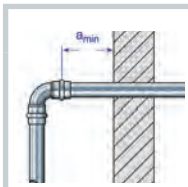
d [mm]	a [mm]	b [mm]	c [mm]
12	25	65	40
15	25	70	
18	25		
22	30	75	
28	30	80	
35	30		

Tab. 34: Pressing between pipe and wall – space requirement Pressgun Picco



d [mm]	Minimum interval a [mm]
12	0
15	
18	
22	
28	
35	10
42	15
54	25

Tab. 35: Interval between the pressings



Minimum space requirement a_{min} [mm]				
d [mm]	PT2	Type PT3-H PT3-EH, PT3-AH	Pressgun Picco	Pressgun 5 4E and 4B
12 to 54	45	50	35	50

Tab. 36: Wall distance

Pipe sizes 76.1 to 108.0 mm – with press chain
Pressing with XL chain for Sanpress XL

Pressing between pipes **pipe and wall**

Pressgun 4B (battery) / 4E / Pressgun 5

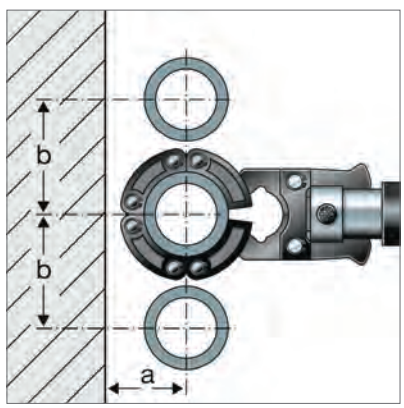


Fig. 105: Pressing between pipes – Pressgun 4B (battery) / 4E / Pressgun 5

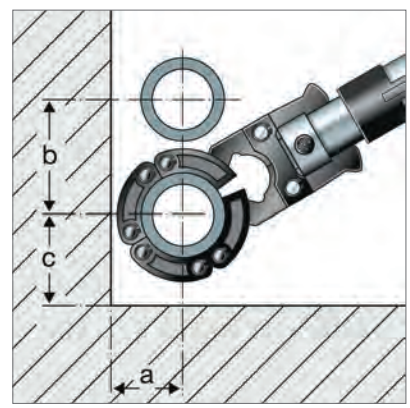


Fig. 106: Pressing between pipe and wall – Pressgun 4B (battery) / 4E / Pressgun 5

d [mm]	a [mm]	b [mm]
76.1	90	185
88.9	100	200
108.0	110	215

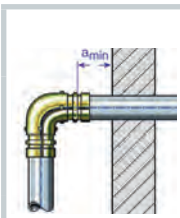
Tab. 37: Pressing between pipes – space requirement Pressgun 4B (battery) / 4E / Pressgun 5

d [mm]	a [mm]	b [mm]	c [mm]
76.1	90	185	130
88.9	100	200	140
108.0	110	215	155

Tab. 38: Pressing between pipe and wall – space requirement Pressgun 4B (battery) / 4E / Pressgun 5

d [mm]	Minimum interval a [mm]
76.1	0
88.9	
108.0	

Tab. 39: Interval between the pressings



Minimum space requirement a_{min} [mm]				
d [mm]	PT2	Type PT3-H PT3-EH, PT3-AH	Pressgun Picco	Pressgun 5 4E and 4B
76.1 to 108.0	45	50	35	50

Tab. 40: Wall distance

Pipe sizes 64.0 to 108.0 mm – with press ring
Pressing with press tool for Sanpress Inox XL, Prestabo XL and Profipress 64.0 mm

Pressing between pipes **pipe and wall**

Pressgun 4B (battery) / 4E / Pressgun 5

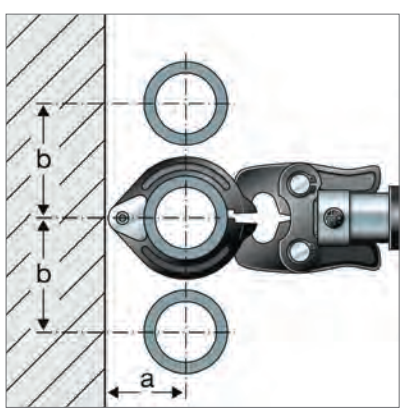


Fig. 107: Pressing between pipes – Pressgun 4B (battery) / 4E / Pressgun 5

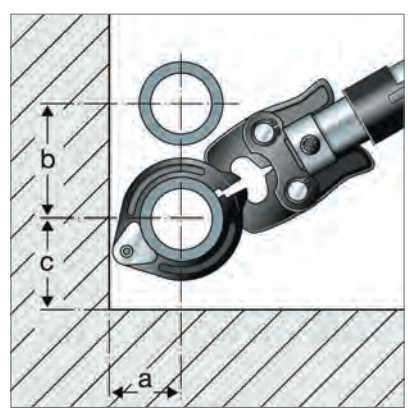


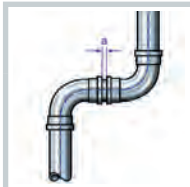
Fig. 108: Pressing between pipe and wall – Pressgun 4B (battery) / 4E / Pressgun 5

d [mm]	a [mm]	b [mm]
64.0	110	185
76.1		
88.9	120	200
108.0	135	215

Tab. 41: Pressing between pipes – space requirement Pressgun 4B (battery) / 4E / Pressgun 5

d [mm]	a [mm]	b [mm]	c [mm]
64.0	110	185	130
76.1			
88.9	120	200	140
108.0	135	215	155

Tab. 42: Pressing between pipe and wall – space requirement Pressgun 4B (battery) / 4E / Pressgun 5



d [mm]	Minimum interval a [mm]
64.0 to 108.0	15

Tab. 43: Interval between the pressings

d [mm]	Minimum interval a [mm]
64.0 to 108.0	20

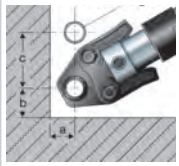
Tab. 44: Wall distance

Megapress: Space requirement when pressing

For technically fault-free pressing, some space is required for placing the press machine. See the following tables for information on the minimum space required in different installation situations.

Size	a	b
⅜	30	70
½	30	70
¾	35	80
1	45	95

Tab. 45: Pressing between pipes – press jaws up to DN25



Size	a	b	c
⅜	35	50	80
½	35	50	80
¾	40	55	90
1	50	65	105

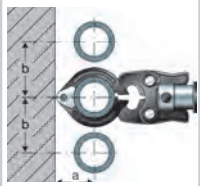
Tab. 46: Pressing between pipe and wall – press jaws up to DN25

Size	Minimum space requirement a_{min} [mm]
⅜	50
½	
¾	
1	

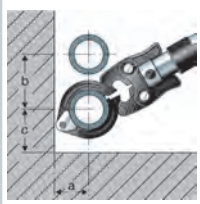
Tab. 47: Distance to wall – press jaws up to DN25

Size	Minimum space requirement a_{min} [mm]
⅜	5
½	
¾	
1	

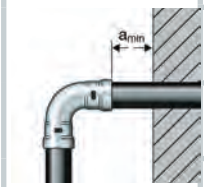
Tab. 48: Minimum interval between the pressings – press jaws up to DN25

	Size	a	b
	½	60	75
	¾	65	85
	1 ¼	95	125
	1 ½	105	135
	2		140
	2 ½	115	150
	3	120	170
	4	135	210

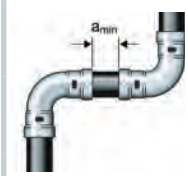
Tab. 49: Pressing with press rings between pipes – press rings DN15–DN100

	Size	a	b	c
	½	60	75	80
	¾	65	85	
	1 ¼	95	125	
	1 ½	105	135	
	2		140	
	2 ½	115	150	100
	3	120	170	120
	4	135	210	140

Tab. 50: Pressing with press rings between pipes – press rings DN15–DN100

	Size	Minimum space requirement a_{min} [mm]
	½	20
	¾	
	1 ¼	
	1 ½	
	2	
	2 ½	
	3	
	4	

Tab. 51: Distance to wall – press rings DN15–DN100

	Size	Minimum space requirement a_{min} [mm]
	½	15
	¾	
	1 ¼	
	1 ½	
	2	
	2 ½	
	3	
	4	

Tab. 52: Minimum interval between the pressings – press rings DN15–DN100

Length expansion

Thermal expansion in installation systems results in major stress in pipelines and device connections. For this reason with very long pipelines, the use of compensators or expansion compensators is prescribed.
Expansion compensators are pipe routes with U- or Z-shaped expansion bends which, given their length and fixation type, are able to absorb movements.

	Heat expansion co-efficient α [mm / m·K]	Length expansion with pipe length = 20 m and ΔT = 50 K [mm]
stainless steel	0.0165	16.5
Galvanised steel	0.0120	12.0
copper	0.0166	16.6
Plastic	0.08 to 0.18	80 to 180

Tab. 53: Length expansion pipe materials

Expansion compensation

For stainless steel and copper pipelines

If the installation situations allow for U- and Z-shaped expansion compensators, their expansion bend length can be calculated as follows

1. Determination of the maximum possible temperature difference ›Δϑ‹.
2. Determination of pipe length ›l0‹.
3. Use these values to calculate the total length by which the pipeline section is extended.
4. Then read off the necessary pipe bend length LBZ or LBU for the respective pipe sizes using the diagrams on the following pages.

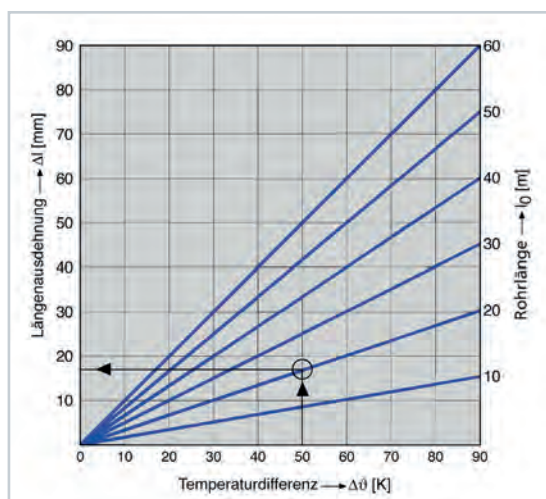


Fig. 109: Length expansion in relation to the temperature difference

Example
Given operating conditions:
1. The operating temperature is between 10 and 60 °C.
   As such Δϑ = 50 K.
2. The pipeline section has a length of l_0 = 20 m.
3. The length expansion co-efficient for stainless steel and copper pipes is
   α = 0.0165 [mm / m·K].
4. Insert values into the formula
   Δl = α [mm / m·K] · L [m] · Δϑ [K]

Consequently:
Length expansion Δl = 0.0165 [mm / m · K] · 20 [m] · 50 [K] = 16.5 mm
5. Selection of the U or Z shape depending on the available space.
6. Reading off of the necessary expansion bend length LBZ from the U or Z diagram. In this example for a Z-shaped expansion bend: On the vertical axis at 16.5 mm trace horizontally to the line of the pipe size used and read off the necessary expansion bend length below on the horizontal axis.

When the nominal pipe diameter is d 28 mm the expansion bend length is L_{BZ} = 1.3 m.

Determination of the expansion bend length for pipes with d ≤ 54 mm

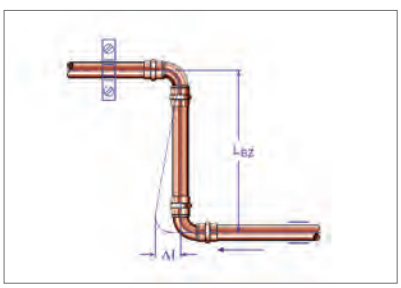


Fig. 110: For the Z shape with expansion bend L_{BZ}

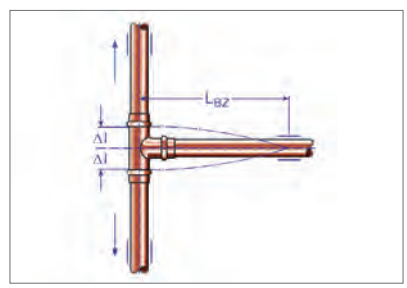


Fig. 111: For the T shape with expansion bend L_{BZ}

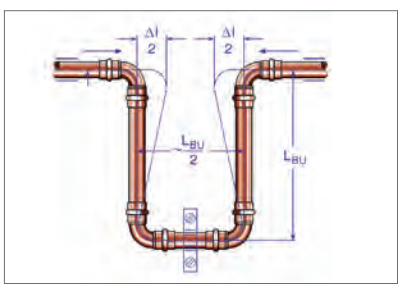


Fig. 112: U-shaped expansion bend with expansion bend L_{BU}

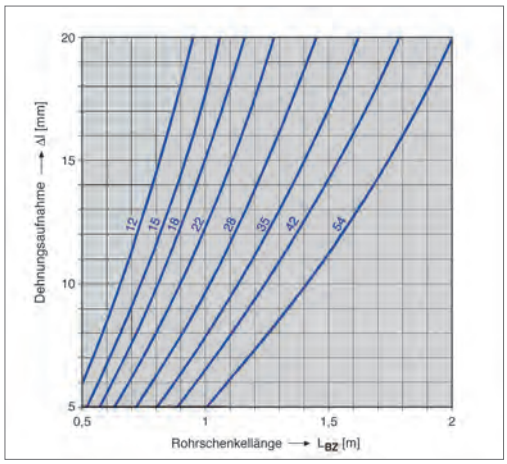


Fig. 113: Length determination for Z- and T-shaped expansion bend

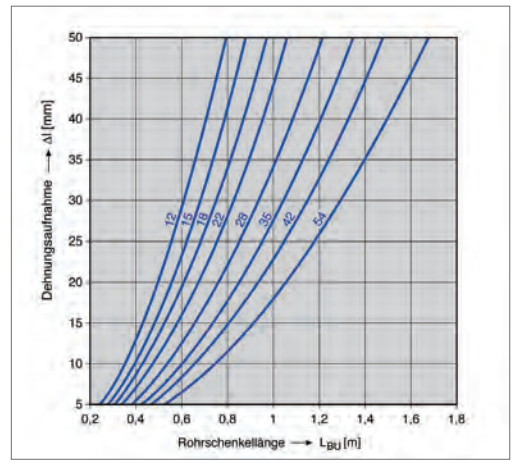


Fig. 114: Length determination for U-shaped expansion bend

Determination of the expansion bend length for pipes with d ≥ 64 mm

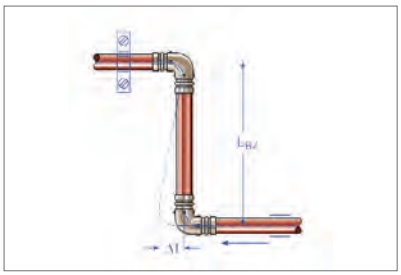


Fig. 115: For the Z shape with expansion bend L_{BZ}

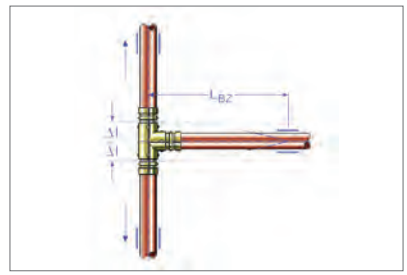


Fig. 116: For the T shape with expansion bend L_{BZ}

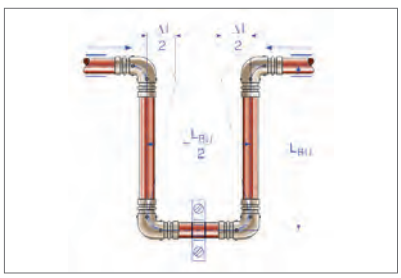


Fig. 117: U-shaped expansion bend with expansion bend L_{BU}

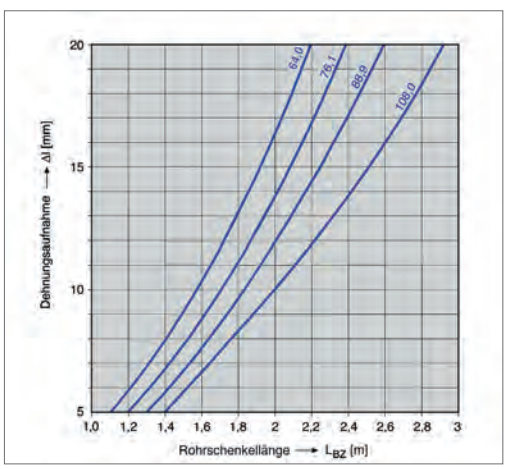


Fig. 118: Length determination for Z- and T-shaped expansion bend

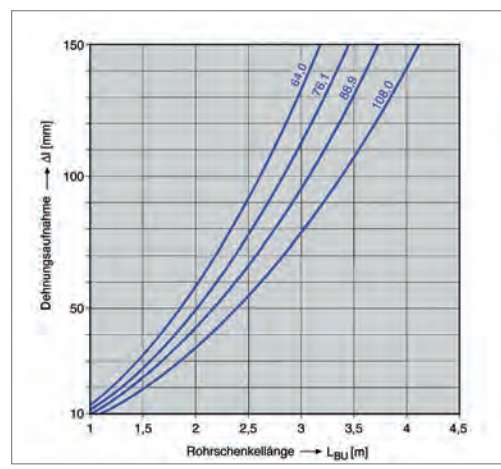


Fig. 119: Length determination for U-shaped expansion bend

Compensators
The alternative to expansion compensators are compensators. They are ideal for absorbing axial movements in pipeline installations at operating temperatures between 20 °C and 120 °C.

Features
- Space-saving alternatives to expansion compensators
- No preloading required
- Sound-absorbing
- Long-lasting and corrosion-resistant
- Suitable for mixed installations

Fig. 120: Axial compensators

Mounting instructions
Pipelines are to be fixed in such a way that non-permitted radial and torsion loads are avoided. The dimensioning of fixing points must be such that they can absorb the considerable forces which occur due to temperature-related length changes. It is important that the fixing points and sliding pipe connections are arranged correctly.
- Always lay pipelines in a straight line
- Prevent radial and torsion loads
- Only one compensator must be placed between two fixing points
- Do not use compensators to change directions
- Protect the stainless steel bellows from mechanical damage

Technical data

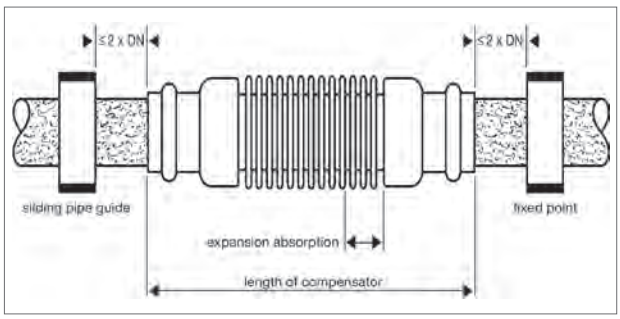


Fig. 121: Dimensions of axial compensators

Compensator d_i/DN	Pressure [MPa]	Active bellows cross-section A [cm^2]	Maximum fixed point-load F_{max} [N]	Expansion compensation[1] [mm]
15/12	1.0	3.10	620	-7
18/15	1.0	3.97	794	-9
22/20	1.0	6.15	1230	-11.5
28/25	1.0	9.02	1814	-14
35/32	1.0	13.85	2770	-13
42/40	1.0	20.42	4048	-15.5
54/50	1.0	30.90	6180	-16

Tab. 54: Z-dimensions for compensator

[1] Dimensioning: 10,000 full movement cycles at nominal pressure, design temperature 85 °C

Function of fixed/gliding points

Fixed points connect the pipeline firmly to the supporting installation body and direct the expansion movement in the desired direction. A pipeline which is not interrupted by a change in direction or which does not have an expansion compensator may only have one fixed point. With long pipelines it is recommended to have the fixed points in the middle of the section thus allowing length expansion in both directions.

Fig. 122: Fixing as a fixed point

Fig. 123: Fixing as a gliding point

Pressure test

The pressure test is normally done with water or another approved testing medium with 1.3x the approved operating pressure. Alternatively, an inert gas, mostly air or nitrogen, with 1.1x the operating pressure can be used. When using liquid testing media with testing pressures above 100 bar, special precautions are prescribed. Details on this and the overall procedure can be found in the AD instructions HP 30.
With underground pipelines, the pressure test must be performed before closing the pipe trench. If this is not possible, the pressure test can be performed using other suitable procedures, e.g. VdTÜV instructions 1051, water pressure tests of underground pipelines according to pressure-temperature measurement procedures.
In special cases, e.g. particular laying types, the presence of components/fittings in the pipeline whereby the functioning of the pressure test would be impaired, the pressure test can be replaced by other suitable procedures, e.g. non-destructive testing in connection with leakage tests. These procedures must be agreed upon between the operator, expert and the manufacturer. The test results must be documented in such a manner that they serve as a basis for recurrent tests.

Documentation – manufacturer certificate

With the so-called manufacturer certificate the manufacturer confirms that the system complies with the requirements of the pressure vessel regulations and the technical rules for pipelines, e.g. TRR 100. In particular the manufacturer confirms that all official requirements are satisfied and the work has been performed properly. Special importance is attached to

- The manufacturer's qualifications
- The materials used
- Calculations for the design and dimensions
- Professional production/laying
- The components used
- Marking of the pipelines and components
- Insulation and corrosion protection

Furthermore, the manufacturer confirms that when subjected to the test pressure of the pressure test the pipeline was tight and there were no deformations of relevance to safety.

If other procedures are used instead of the pressure test, both these and the results are to be documented.
The subcontracting of work to other manufacturers must be documented.
The proper production of the system is only fully confirmed once certifications stating that this work has been executed properly have been submitted.
The documents required to identify/mark the pipeline are to be included with the manufacturer certificate.
During the acceptance test the expert must be provided with the documents which served as the basis for the manufacturer certificate upon request. These documents must correspond to the actual state of the pipeline.
Any information from the manufacturer which must be noted in the acceptance test or the recurring tests must be stated in the manufacturer certificate.

Marking of pipelines

Pipelines in buildings are mostly laid in bundles. The pipes which lay alongside each other must be marked according to the media they transport in order to rule out the risk of mix-ups and accidents when performing repairs.
The size, appearance and spacing of the media markings and their arrangement on manifolds and outlets are regulated in DIN 2403.

Medium	Group	Colour	RAL
Water	1	green	6023
Vapour	2	red	3001
Compressed air	3	grey	7004
Gas flammable	4	yellow/red	1003/3001
Gas non-flammable	5	yellow/black	1003/9004
Acid	6	orange	2010
Lyes	7	violet	4008
Oxygen	0	Blue	5005

Tab. 55: Marking of pipes according to DIN 2403 (excerpt)

Press tools

Intended use

The functional safety of the Viega press connector systems is primarily dependent on the perfect condition of the press machines, press jaw, rings, chains and (hinged) adapter jaws used. The detailed instructions for use included when purchasing press tools are to be noted.
All the product information is to be provided when lending press machines.
Press machines can be used at temperatures of -5 to +40 °C – operating temperature assumed.
If the temperature is well below 0 °C, the hydraulic oil becomes viscous and the machines have to be warmed up to room temperature before use. If this is not done, functionality is imparied and the mechanics may be damaged.
Should a press machine be completely immersed in water, it must be sent to an authorised service station for testing before further use.
Irrespective of the statutory regulations, Viega guarantees the leak tightness of the connection according to the liability agreement with the Associati-on for Sanitation, Heating and Air Conditioning (ZVSHK) and the Federal Industrial Association for Heating, Air Conditioning and Sanitary Engineering/ Technical Buildings Systems (BHKS).
As such, the warranty period demanded by law is extended when using Viega press machines and Viega press tools.

Fig. 124: Viega press machines with rechargeable battery and power pack

System press machines

Safe, low-maintenance press machines are an important part of the Viega system. They have been optimised for the materials and dimensions of the Viega press connectors and thus guarantee safety and function when used on site. Also because they can be used everywhere – with and without a mains connection. We recommend using the following press machines

- Pressgun 5 with power pack
- Pressgun 5 with rechargeable battery
- Pressgun 4 E
- Pressgun 4 B
- Pressgun Picco
- Picco
- PT3-H/EH
- PT3-AH
- PT2

Pressgun 5 with power pack

Pressgun 5

230 V power pack
or
lithium ion rechargeable battery

Fig. 125: Pressgun 5 with power pack

Features

- Suitable for the following sizes:
  - Metal press connector 12–108.0 mm
  - Megapress press connector D ⅜–D 4
  - Plastic pipe press connector 12–63 mm
- Ergonomic design for single-handed operation
- 3.2 kg weight without press jaw
- 180° rotatable head
- Safety functions – trigger delay, bolt lock, automatic press cycle, automatic return flow
- Integrated LED lamp for illuminating the pressing point
- Integrated LED status display
- Long service interval: 4 years for 40,000 pressings, depending on what occurs first. Safety lock after 42,000 pressings

Pressgun 5 with rechargeable battery

Battery-powered press machine with lithium ion battery technology.
Small light batteries offering high performance, even at low temperatures – no memory effect when charging.

Pressgun 5
18 V / 2.0 Ah
Lithium ion rechargeable battery
or
230 V power pack

Fig. 126: Pressgun 5 with rechargeable battery

Quick creation of pressing force thanks to electrohydraulics – duration of pressing max. 3–4 seconds.

Features

- Suitable for the following sizes
  - Metal press connector 12 – 108.0 mm
  - Megapress press connector D ⅜ – D 4
  - Plastic pipe press connector 12 – 63 mm
- Ergonomic design for single-handed operation
- 3.2 kg weight without press jaw
- 180° rotatable head
- Safety functions – trigger delay, bolt lock, forced pressing, automatic return flow
- Integrated LED lamp for illuminating the pressing point
- Integrated LED status display
- Long service interval: 4 years for 40,000 pressings, depending on what occurs first. Safety lock after 42,000 pressings 18 V / 4.0 Ah rechargeable battery optionally available

Press-gun 5	Model	Art. no.	Suitable for press connector systems	Press jaw sizes [mm]
Power pack	2293.1	707 026	Metal	15 / 22 / 28
Rechar-geable battery	2293.2	707 019		
Power pack	5393.1	707 040	Raxofix	16 / 20 / 25
Rechar-geable battery	5393.2	707 033		
Power pack	2295.1	707 163	Without press jaws	
Rechar-geable battery	2295.2	707 156		

Tab. 56: Pressgun 5 in set with press jaws – delivery overview

Pressgun Picco (new generation) – rechargeable battery

Pressgun Picco
18 V / 2.0 Ah
Lithium ion recharge-able battery
or
230 V power pack

Fig. 127: Pressgun Picco

Pressgun Picco is the lightest and smallest of the Viega press machines. It is particularly easy to handle and allows users to work in constricted spaces and in tight pre-wall constructions. It is primarily used for installing Viega plastic pipe installation systems and for customer service repair work. Picco press jaws have been designed to weigh less and are therefore not compatible with the other Viega press tools.

Features

- Suitable for the following sizes:
  - Metal press connector 12 – 35 mm
  - Megapress press connector D ⅜ – D ¾

- Plastic tube press connector 12 – 40 mm
- Ergonomic design for single-handed operation
- 2.5 kg weight without press jaw
- 180° rotatable head
- Safety functions – trigger delay, bolt lock, forced pressing, automatic return flow
- Integrated LED lamp for illuminating the pressing point
- Integrated LED status display
- Long service interval: 4 years or 30,000 pressings, depending on what occurs first. Safety lock after 32,000 pressings
- 18 V / 4.0 Ah battery optionally available

Lithium ion rechargeable battery

battery charger

230 V power pack

Fig. 128: Lithium ion rechargeable battery – 18 V / 2.0 Ah

Fig. 129: Battery charger

Fig. 130: 230 V power pack

Fig. 131: Lithium ion rechargeable battery – 18 V / 4.0 Ah

Compatibility

The batteries, the battery charger and the power pack are compatible with the old Pressgun press machines.

For details on the compatibility of press tools, see the overview on page 101.

Compatibility with third-party products
One of the prerequisites for certification of Viega piping systems is successful testing of the connecting technology according to DVGW worksheet W 534 by an approved testing institute. To this end, the press connections are only produced using Viega press machines and Viega press jaws, chains and rings. If the trade professional uses press tools from other manufacturers, in the interests of liability security it is recommended to get proof of suitability from the other press tool manufacturers (press machines, press jaws, rings and chains). If, in the event of a complaint, it can be shown that the damage was caused through the use of press tools from other manufacturers, Viega shall refuse to accept claims for damages.

System press jaws, chains and rings

Press rings and hinged adapter jaws

Thanks to the smooth pivoting through almost 180°, the patented Viega press rings and hinged adapter jaws can be used for pressing in the most challenging of conditions, e.g. in installation shafts and pre-wall installations.

For Viega piping systems made of metal
(Hinged) adapter jaws and press rings are compatible with all Viega press machines.

Fig. 132: Case set

Fig. 133: Press jaw – 180° angle of rotation

Case set

Press rings for sizes: 12–35 mm

With hinged adapter jaw P 1 (Picco)

Without fig. 42 to 54 mm with Z2

Press rings and hinged adapter jaws

For Sanpress Inox XL, Prestabo XL, Profipress XL (copper press connectors)

Fig. 134: Press rings and hinged adapter jaw
sizes: 64.0 / 76.1 / 88.9 / 108.0 mm

For Megapress

Fig. 135: Press rings and hinged adapter jaws
sizes: D 1¼; D 1½; D 2

Press chains/press jaws

Press chain with adapter jaw

XL sizes

Press chain/adapter jaw

Fig. 136: Press chain/adapter jaw sizes for Sanpress XL press connector made of gunmetal or silicon bronze: 76.1–108.0 mm

For all Viega press machines – except Picco and Pressgun Picco

Fig. 137: Press jaws
sizes for plastic piping systems: 12–63 mm
sizes for metal press connector systems: 12–54 mm

For Picco and Pressgun Picco

Fig. 138: Press jaws Picco
sizes for plastic piping systems: 12–40 mm
sizes for metal press connector systems: 12–35 mm

Press jaws

For metal and plastic piping systems

For Picco and Pressgun Picco

Fig. 139: Press jaw Picco with snap action
sizes for metal press connector systems: 12–35 mm

Press jaw

Pressgun Picco press jaws with snap action

These press jaws are opened manually in the usual manner and, thanks to the spring force, remain open until the start switch on the press machine is actuated. However, the position of the press jaw can still be corrected before actual pressing. This offers numerous advantages, e.g. working overhead and with just one hand.

Press jaws
For Raxofix

For Raxofix press connector system

Fig. 140: Press jaws
Suitable for all Viega press machines – except Picco, Pressgun Picco sizes: 16–63 mm

For Raxofix press connector system

Fig. 141: Press jaws Picco
Suitable for press machines Picco, Pressgun Picco sizes: 16–40 mm

Press jaw
For Megapress

For Megapress press connector system

Fig. 142: Press jaw
Suitable for all Viega press machines – except Picco and Pressgun Picco sizes: D ⅜–D 1

For Megapress press connector system

Fig. 143: Press jaws Picco
Suitable for press machines Picco, Pressgun Picco sizes D ⅜–D ¾

Press Booster for Megapress XL

- Innovative force amplifier for Megapress XL with integrated hinged adapter jaw for the dimensions 2½, 3 and 4 inches.
- Optimally dimensioned pressing force for maximum safety.
- Pressing of Megapress XL press connectors in less than 16 seconds.
- A weight of just 9 kg and a handy carrying strap ensure ideal ergonomics and simple handling.
- Can be used with all Viega press machines from type 2 to Pressgun 5 (not compatible with the Pressgun Picco).
- The specific ball heads of the hinged adapter jaw prevent confusion with other Viega press rings.
- Long service intervals thanks to the system reliability with which Viega has become synonymous.

Fig. 144: Press Booster for Megapress XL

Product groups
F2

Megapress press-in branch connector

The Megapress press-in branch connector can be used to make connections subsequently in existing steel pipe installations. A hole is drilled in the steel pipe (D 1½ – D 6) using a tool set and the Megapress press-in branch connector is then pressed in. The steel pipe installation is operational immediately afterwards.
For pipe sizes: D 1½ / D 2 / D 2½ / D 3 / D 4 / D 5 / D 6

Assembly steps

Megapress press-in branch connector
With internal thread Rp ¾

Fig. 145: Secure the holding device for guiding the drilling shaft to the steel pipe.

Fig. 146:
– Drill into the steel pipe
(Fig: Steel chips are suctioned away)
– Disassemble the holding device

Fig. 147: Press the press-in branch connector to the steel pipe.
The pipe outlet has been created.

Fig. 148: Example: Press-in branch connector in Rp ¾ for thermometers, manometers, emptying or connecting a pipe

Compatibility

Viega press machines and press tools 1/9

Systems	Profipress/G Seapress Prestabo Sanpress Inox/G Sanpress					
Press tool sets Press jaws Press rings Press chains						
					Can no longer be delivered!	Can no longer be delivered!
Product designation	PT2/SOM	PT2/SOM	PT2	PT2	SOM	SOM
Model	2299.6	2299.62	2299.91	2299.9	2299.2	2299.4
Article number	313012	449377	42/54			262211
Dimension [mm]	12–35	15–28		12–54	12–54 14/16	42/54
Bolt dia. [mm]	14/15	14/15	14	14	15	15
 Pressgun 5 With power pack	✓	✓	✓	✓	✓	✓
 Pressgun 5 With recharge-able battery	✓	✓	✓	✓	✓	✓
 Pressgun Picco	–	–	–	–	–	–

Compatibility
Viega press machines and press tools 2/9

Systems	**Profipress / G** **Seapress** **Prestabo** **Sanpress Inox / G** **Sanpress**					
Press tool sets **Press jaws** **Press rings** **Press chains**						
	Can no longer be delivered!			Can no longer be delivered!		
Product designation	SOM/M	Picco	Picco	Z1	Z1	Z2
Model	2299.4M	2484.9	2489.9	2296.3	2296.2	2296.2
Article number	315337			472757	472733	472740
Dimension [mm]	42/54	12–35	12–35	15–35	12–35 16–25	42–108.0 32–63
Bolt dia. [mm]	15	12	12	14	14	14
 Pressgun 5 With power pack	Only size 42	–	–	✓	✓	✓
 Pressgun 5 With recharge-able battery	Only size 42	–	–	✓	✓	✓
 Pressgun Picco	–	✓	✓	–	–	–

Compatibility

Viega press machines and press tools 3/9

Systems	Prestabo XL Sanpress Inox/XL Sanpress Inox G/XL Profipress XL (only press connectors made of copper) Seapress XL	
Press tool sets Press jaws Press rings Press chains		
Product designation	PT2	
Model	2497.3XL	2497.2XL
Article number	562854	
Dimension [mm]	76.1 – 108.0	64.0 – 108.0
Bolt dia. [mm]	14	–
 Pressgun 5 With power pack	✓	✓
 Pressgun 5 With recharge-able battery	✓	✓
 Pressgun Picco	–	–

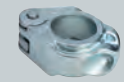
Compatibility

Viega press machines and press tools 4/9

Systems	Profi-press / G Seapress Prestabo Sanpress Inox / G Sanpress	Profipress XL Sanpress XL			Sanfix Fosta / Fonterra	
Press tool sets Press jaws Press rings Press chains						
Product designation		PT2		PT2	PT2 / SOM	PT2 / SOM
Model	2296.1	2297.3XL	2297.2XL	2297.1XL	2299.81	2299.8
Article number		362959		359232	490652	357139
Dimension [mm]	12 – 54	76.1 – 108.0	76.1 – 108.0	76.1 – 108.0	16 – 32	16 / 20
Bolt dia. [mm]	–	14	–	14	14 / 15	14 / 15
 Pressgun 5 With power pack	✓	✓	✓	✓	✓	✓
 Pressgun 5 With recharge-able battery	✓	✓	✓	✓	✓	✓
 Pressgun Picco	Only sizes ≤ 35 mm	–	–	–	–	–

Compatibility

Viega press machines and press tools 5/9

Systems	**Sanfix Fosta**	**Sanfix Fosta / Plus Fonterra**		**Geopress**		
Press tool sets **Press jaws** **Press rings** **Press chains**						
Product designation	PT2	PT2 / SOM	Picco	PT2	PT2	
Model	2299.41	2299.7	2484.7	9696.6	9696.7	9696.1
Article number	612191			469764	469771	
Dimension [mm]	50 / 63	14 – 63	12 – 40	20 / 25	32 – 63	20 – 63
Bolt dia. [mm]	14	14 / 15	12	14	14	–
 Pressgun 5 With power pack	✓	✓	–	✓	✓	✓
 Pressgun 5 With recharge-able battery	✓	✓	–	✓	✓	✓
 Pressgun Picco	–	–	✓	–	–	–

Compatibility

Viega press machines and press tools 6/9

Systems	**Profipress / G Seapress Prestabo Sanpress Inox / G Sanpress**			**Fonterra**	**Profipress / G Seapress Prestabo Sanpress Inox / G Sanpress 12 – 22 mm Sanfix Fosta / Plus 14 – 20 mm**
Press tool sets Press jaws Press rings Press chains					
					Can no longer be delivered!
Product designation	Press ring set + P1	Z2	P1	PT2	Combi press jaw
Model	2496.3	2296.4	2496.1	2799.7	2298.3
Article number	622664	472764	622657	425302	301057
Dimension [mm]	12–35	42 / 54	12 – 35	12	
Bolt dia. [mm]	12	14	12	14	15
 Pressgun 5 With power pack	–	✓	–	✓	✓
 Pressgun 5 With recharge-able battery	–	✓	–	✓	✓
 Pressgun Picco	✓	–	✓	–	–

Compatibility

Viega press machines and press tools 7/9

Systems **Press tool sets** **Press jaws** **Press rings** **Press chains**	**Raxofix**     				
Product designation	PT2	PT2	PT2	Picco	
Model	5399.8	5399.81	5399.7	5384.7	5396.1
Article number	645380	645397			
Dimension [mm]	16/20	16–32	16–63	16–40	16–63
Bolt dia. [mm]	14	14	14	12	-
 Pressgun 5 With power pack	✓	✓	✓	–	✓
 Pressgun 5 With recharge-able battery	✓	✓	✓	–	✓
 Pressgun Picco	–	–	–	✓	Only sizes ≤ 32 mm

Compatibility
Viega press machines and press tools 8/9

Systems **Press tool sets** **Press jaws** **Press rings** **Press chains**	**Megapress**				
					
Product designation	PT2	PT2	Picco		PT2
Model	4299.61	4299.9	4284.9	4296.1	4178.5
Article number					
Dimension [inch]	½–2	⅜–1	⅜ – ¾	⅜–2	1½–6
Bolt dia. [mm]	14	14	12	-	-
 Pressgun 5 With power pack	✓	✓	–	✓	✓
 Pressgun 5 With recharge-able battery	✓	✓	–	✓	✓
 Pressgun Picco	–	–	✓	Only sizes ⅜ – ¾	–

Compatibility

Viega press machines and press tools 9/9

Systems Press tool sets Press jaws Press rings Press chains	Megapress XL			
				
Product designation	PT2		PT2	PT2
Model	4296.4XL	4296.1XL	4296.5XL	4296.2XL
Article number	753924		762063	762056
Dimension [inch]	2½–4	2½ –4	3–4	2½
Bolt dia. [mm]	14	-	-	14
 Pressgun 5 With power pack	✓	✓	✓	✓
 Pressgun 5 With recharge-able battery	✓	✓	✓	✓
 Pressgun Picco	–	–	–	–
 Pressgun Press Booster	–	✓	✓	–

Maintenance and service

Maintenance tips

Viega system press tools

The functional safety and permanent leak tightness of the Viega press systems primarily depends on the functional and operational safety of the Viega system press tools, i.e. the Viega press machine plus suitable Viega press jaw, ring, chain, and (hinged) adapter jaw.
These Viega system press tools have been specifically designed for and adapted to the installation of the Viega press connector systems. If systems from other manufacturers are used, Viega cannot provide any warranties.

System press machines

Viega system press machines generate a specified pressure for the pressing process. To guarantee operational safety, a leak-free hydraulic system is required; however, natural wear and tear on such heavily used components is unavoidable. To ensure the continuous operational safety and reliability of the system press machines, these must be maintained regularly. Usually, tools are sent for maintenance to the service points named by Viega, or maintained on the occasion of local promotions at service points at the specialist wholesaler's, see page 99.

Maintenance by users

Store the press jaw fixtures with the press rolls in a clean and dry place. Clean the press tools with a cloth after each use. If necessary, oil moving parts such as bolts and press rolls. Regularly polish and oil the contours of the press jaws, rings, chains and inserts with fine steel wool or a cleaning fleece.

Type	Maintenance intervals
Pressgun 5	After 40,000 presses, service information is shown as a LED display. Safety shutdown will take place after a further 2,000 pressings. Maintenance after 4 years at the latest.
Pressgun Picco	After 30,000 presses, service information is shown as a LED display. Safety shutdown will take place after a further 2,000 pressings. Maintenance after 4 years at the latest.
Pressgun 4 E	
Pressgun 4 B	
Type PT3-AH	After 20,000 presses, service information is shown as a LED display. Safety shutdown will take place after a further 2,000 pressings. Maintenance after 4 years at the latest.
Picco	
Type PT3-H/EH	
Type 2	Every 2 years.
Model 2478	At least once a year.
Model 2475	After 20,000 presses, an LED display is shown. Maintenance after 4 years at the latest.

Tab. 57: Viega press machines – maintenance intervals

Press rings/press jaws

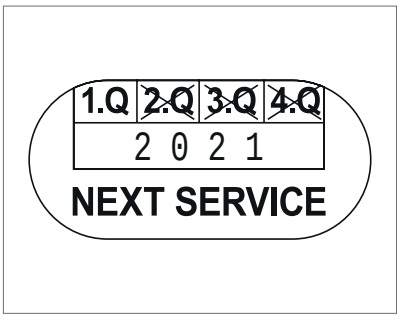


Fig. 149: Example of press jaw sticker, Reminder of maintenance in the 3rd quarter of 2021

Service reminder

It is recommended that the system press jaws, chains and rings are also inspected together with maintenance of the system press machines. During the procedure, consumables are replaced, press jaw contours are revised and the press jaws, chains and rings are reset. Since 2012, Viega press jaws, chains and rings have been gradually provided with maintenance stickers, which show the next recommended inspection date. Example Fig. 149

Press tool service

Germany
Hans-Joachim Voigt & Sohn
Nordlichtstraße 48/50
13405 Berlin
Telefon 030 4134041
Telefax 030 4133057
info@voigt-und-sohn.de
www.voigt-und-sohn.de

Martin Unterreitmaier GmbH
Drygalski Allee 33 Eingang D
81477 München
Telefon 089 83969091
Telefax 089 83969092
info@unterreitmaier-gmbh.de
www.unterreitmaier-gmbh.de

Hamburger-Hochdruck-Hydraulik GmbH
Billwerder Billdeich 601c
21033 Hamburg
Telefon 040 751190-0
Telefax 040 751190-39
service@hhhydraulik.com
www.hhhydraulik.com

Austria
König & Landl GmbH
Brunnthalgasse 1
2020 Hollabrunn
Telefon (+43) 01 479 748450
Telefax (+43) 01 479 748455

Fire extinguishing systems

Overview of Viega systems

Fig. 150: Wall hydrant with Sanpress Inox XL

Fire extinguishing systems are fire prevention devices which serve to save persons and protect buildings.
The Viega installation systems Profipress, Sanpress, Sanpress Inox, Megapress and Prestabo hot dip galvanised are suitable for wet, wet/dry and dry fire extinguishing systems according to DIN 14462.

- The Sanpress and Sanpress Inox systems are DEKRA-tested in accordance with DIN 14462.
- Sanpress Inox/Inox XL 172146869-01
- Sanpress/XL 172146869-02
- Prestabo hot dip galvanised VdS G4090017
- Megapress VdS G414021

	Profipress	Sanpress Inox	Sanpress	Prestabo hot dip galvanised	Megapress
Application area	Only fire extinguishing systems wet	Fire extinguishing systems wet wet/dry dry	Fire extinguishing systems wet wet/dry dry	Only fire extinguishing systems wet	Fire extinguishing systems wet wet/dry dry
Pipe	Copper according to DIN EN 1057	Stainless steel 1.4401 or 1.4521	Stainless steel 1.4401 or 1.4521	Internally and externally galvanised steel pipe	Steel pipes – seamless and with seam heat sealing: black, galvanised, industrially painted or powder-coated according to DIN EN 10255, DIN EN 10216-1, DIN EN 10217-1 or DIN EN 10220
Nominal diameter	DN10 12 x 1.0 mm DN12 15 x 1.0 mm DN15 18 x 1.0 mm DN20 22 x 1.0 mm DN25 28 x 1.5 mm DN32 35 x 1.5 mm DN40 42 x 1.5 mm DN50 54 x 2.0 mm 64.0 x 2.0 mm DN65 76.1 x 2.0 mm DN80 88.9 x 2.0 mm DN100 108 x 2.0 mm	– – DN15 18 x 1.2 mm DN20 22 x 1.2 mm DN25 28 x 1.2 mm DN32 35 x 1.5 mm DN40 42 x 1.5 mm DN50 54 x 1.5 mm 64.0 x 2 mm DN65 76.1 x 2 mm DN80 88.9 x 2 mm DN100 108.0 x 2 mm	– – DN15 18 x 1.2 mm DN20 22 x 1.2 mm DN25 28 x 1.2 mm DN32 35 x 1.5 mm DN40 42 x 1.5 mm DN50 54 x 1.5 mm 64.0 x 2 mm DN65 76.1 x 2 mm DN80 88.9 x 2 mm DN100 108 x 2 mm	– – – DN20 22 x 1.5 mm DN25 28 x 1.5 mm DN32 35 x 1.5 mm DN40 42 x 1.5 mm DN50 54 x 1.5 mm 4.0 x 2.0 mm DN65 76.1 x 2.0 mm DN80 88.9 x 2.0 mm DN100 108.0 x 2.0 mm	½ (DN15) Wall thickness 2.6 to 3.3 mm ¾ (DN20) Wall thickness 2.6 to 3.3 mm 1 (DN25) Wall thickness 2.6 to 3.3 mm 1 ¼ (DN32) Wall thickness 2.6 to 3.3 mm 1 ½ (DN40) Wall thickness 2.6 to 3.3 mm 2 (DN50) Wall thickness 2.6 to 3.3 mm 2 ½ (DN65) Wall thickness 2.6 to 4.5 mm 3 (DN80) Wall thickness 2.9 to 5.0 mm 4 (DN100) Wall thickness 3.2 to 5.4 mm
Press connector	Copper and gunmetal or silicon bronze	stainless steel	Gunmetal or silicon bronze	Galvanised steel	Non-alloyed steel
Sealing element	EPDM	EPDM	EPDM	EPDM	≤ DN50 EPDM > DN65 FKM
Pressure range	1.6 MPa	Tab. 62 on page 114	1.6 MPa	Tab. 62 on page 114	Tab. 62 on page 114
Standard, certificate, Proof of suitability	DIN 1988-600; DVGW certificate VdS: G 4980009	DIN 1988-600; DVGW certificate; DEKRA: 172146869-01 VdS: G 4070017	DIN 1988-600; DVGW certificate; DEKRA: 172146869-02	VdS: G 4090017	VdS: G414021
Note	Do not connect to potable water installations. Testing intervals acc. to DIN 14462-6 (maintenance) are permitted.				

Tab. 58: Fire extinguishing systems according to DIN 14462

Classification – integration in the regulations

The building regulations for the various federal states define the general requirements for structural systems to prevent and fight fires.
The requirements for fire extinguishing systems are derived from the building regulations of the federal states and the respective ordinances, guidelines and recognised rules of engineering.
A distinction is made between

- Automatic fire extinguishing systems
- Non-automatic fire extinguishing systems
- Fire fighting aids in various configurations

Fire extinguishing systems (FES)			
Non-automatic FES	**Automatic FES**	**Fire fighting aids**	
Wall hydrant type "S"	Water extinguishing systems wet, dry, with open pipeline network		
Wall hydrant type "F" wet, wet/dry	Gas extinguishing system		
Dry riser pipe	Powder extinguishing systems		

Tab. 59: Classification of fire extinguishing systems

The special building regulations issued by the federal states formulate requirements for the various types of fire extinguishing systems depending on the size of the building and its use.

	Non-automatic	**Automatic**
Garage regulations	x	x
Regulations/guidelines for meeting places	x	x
Regulations/guidelines for sales locations	x	x
Hospital building regulations	x	
High-rise building guidelines	x	x
Industrial building guidelines		x

Tab. 60: Fire extinguishing systems in the special building regulations

The fire protection authorities can specify further requirements with due regard to the principle of proportionality.
A core component of the building approval process is the fire protection concept which formulates the requirements for fire extinguishing systems and which often goes beyond the above-mentioned regulations. Automatic fire extinguishing systems are often specified in order to extend the lifetime of components in the event of a fire or to extend fire compartments or the permissible length of escape routes.
These serve to save lives, protect individuals and fight fires. For this reason, particular requirements are made in terms of the planning, installation and operation of these systems.
Fire extinguishing systems can only reliably fulfil their protective function if the client/owner of the building employs a suitable concept right from the planning phase.
This so-called fire protection concept comprises planning, execution and operation.
It includes

- The use of products and systems with proofs of suitability similar to the usability and compliance certificates for materials and components.
- The awarding of planning to authorised planning specialists.
- The involvement of experts for fire extinguishing systems recognised by the building authorities.
- The awarding of installation, repair and maintenance work on the systems to authorised specialist companies.
- The creation of a concept for ensuring back-up measures in the event of the fire extinguishing system being taken out of operation.
- The creation of a comprehensible description of the fire protection concept which takes necessary deviations, e.g. for adjacent buildings, into account.

The importance of the fire protection concept is evident in the current sample high-rise building regulations (MHHR). In contrast to the previous directives, the MHHR assumes that the fire service will fight the fire from inside the building. Even with building heights of up to 22 m, in terms of planning fire fighting efforts from the outside are the exception to the rule. That is why MHHR section 6.3 stipulates that, in addition to automatic extinguishing systems, wet riser pipes must be installed with wall hydrants in all the necessary stairwells (incl. safety stairwells) on each floor.
The use of dry riser pipes is not permitted here as their functionality can be impaired unnoticed and, in the event of a fire, this firstly has to be restored by the deployed fire service.

Depending on the building floor area and the fire hazard class, with sufficient planning of the wall hydrants, up to a third fewer fire extinguishers may be kept. In the industrial sector wall hydrants with flat hoses are used to in order to be able to provide large amounts of water to fight fires. Given the special features of these systems, their usage must be practiced regularly and they must only be deployed by trained personnel.

Planning of extinguishing and potable water concepts
In the fire protection concept the planner describes which piping system is to be used to provide extinguishing water to the individual extinguishing water connections. In order to draw up a functioning fire protection concept, the planner not only has to be familiar with the local conditions for the extinguishing water supply but also have knowledge of the properties and possibilities offered by the potable water supply. He must not assume that the supply company also provides a sufficient amount of extinguishing water in addition to a sufficient supply of potable water.
Since connected potable water and extinguishing water installations can lead to hygiene problems due to stagnation – contamination of the potable water – the fire protection concept must always be the result of close cooperation between the planners in both areas.
System approvals
Plastic pipes may only be used as extinguishing water lines if placed underground or used in house connection rooms without fire loads.

Note:
Installation systems with press, clamp and plug connectors in fire extinguishing systems (dry and wet/dry) may be used if they have been approved for the specific area of application.

Non-automatic fire extinguishing systems

"Non-automatic fire extinguishing systems" are extinguishing water pipelines and extraction points (hydrants) which, in the event of a fire, allow extinguishing devices to be connected.
A distinction is made between "wet" extinguishing water pipelines which are always ready for use and constantly pressurised and "dry" systems which firstly must be filled in the event of a fire before they can be used.

Classification

- "wet"
  Extinguishing water pipelines with extinguishing water extraction points which are always connected to the potable water supply and thus always ready for use.
  Use by the fire service and lay people, with the exception of wall hydrants with flat hoses.

- "wet/dry"
  Extinguishing water pipelines with extinguishing water extraction points which are only connected to the potable water supply by means of quick-opening fittings in the event of a fire. Use by the fire service and lay people, with the exception of wall hydrants with flat hoses.
- "dry"
  Non-potable water pipelines with extinguishing water extraction points which are only filled by the fire service in the event of a fire without a direct connection to the potable water installation. With these systems, the time-consuming laying of hoses is not required.
  Use only by the fire service.

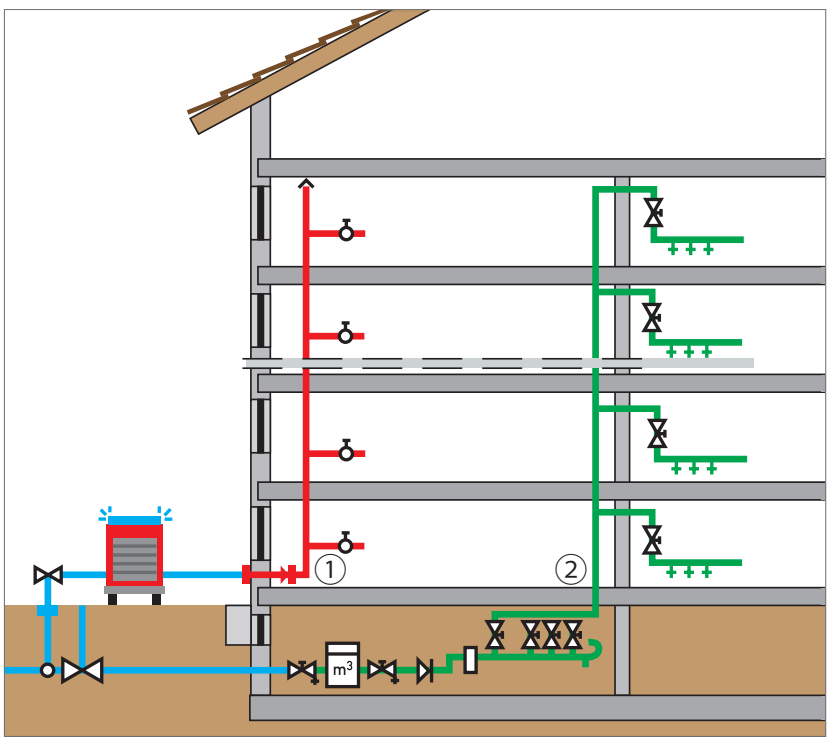


Fig. 151: Dry fire extinguishing system

1 Flammable (B1/B2) and non-flammable (A) installation pipes are permitted
2 Non-flammable dry fire extinguishing line according to DIN 14462

- Potable water installations with wall hydrants
  Potable water pipelines with directly connected Type S wall hydrants according to DIN 14461-1, with integrated safety combination (backflow preventer and aerator, design C) in which potable water cannot become stagnant.
  Use only by lay people.

The main distinguishing feature between wall hydrants of type S and type F is the hose connection valve.

- Type S DN25, with pipe aerator design C
- Type F DN50

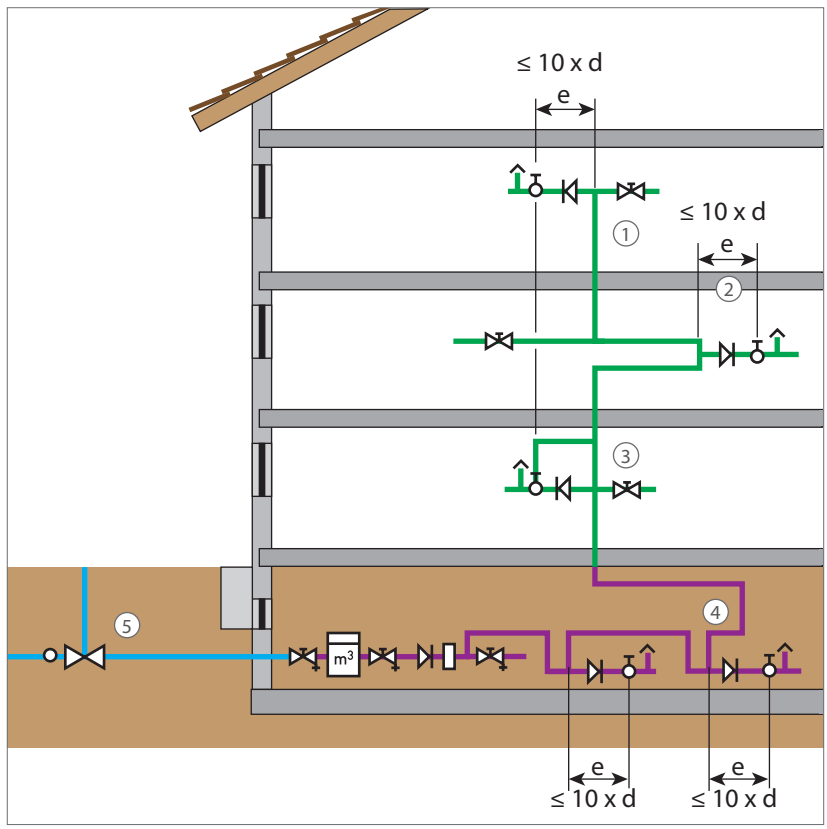


Fig. 152: Potable water installation with wall hydrants

1 The volume flow of potable water must be greater than the demand for extinguishing water, whilst taking simultaneity into account. The consumer fittings designed to be fail-safe.

2 e ≤ 10 x d maximum distance between potable water pipeline in which a sufficient flow volume flows continuously and the shut-off valve of the type S wall hydrant.

3 Non-flammable (A) and flammable (B1/B2) installation pipes are permitted. These must be laid behind the non-flammable wall coverings of installation walls or be enclosed in fire-resistant material. Flammable pipes must be concealed. In the event of a fire, a sufficient supply of extinguishing water must be guaranteed.

4 Non-flammable potable water pipelines to supply self-help facilities if the pipeline is laid exposed in the "protection areas" of the self-help facility. Central supply lines subject to an increased risk of fire in the "protection areas" must be non-flammable. Any deviations must be coordinated with the fire protection concept.

5 Supply line

Standards and regulations

Fire extinguishing and fire protection systems must be planned and executed by specialist companies. In additional the legal building regulations and technical construction provisions, the following standards and regulations must also be observed.

- Potable Water Ordinance (TrinkwV)
- Model directive on technical requirements for fire protection with respect to piping systems (MLAR)
- DIN 4102-4: Fire behaviour of building materials and building components: Synopsis and application of classified building materials, components and special components; 1994-03
- DIN 1988-200: Codes of practice for potable water installations - Part 200: Installation Type A (closed system) - Planning, components, apparatus, materials; DVGW code of practice; 2012-05
- DIN EN 1717: Protection against pollution of potable water installations and general requirements of devices to prevent pollution by backflow; German version EN 1717:2000; Technical rule of the DVGW; 2011-08
- DIN 1988-500: Codes of practice for potable water installations - Part 500: Pressure boosting stations with RPM-regulated pumps; DVGW code of practice; 2011-02
- DIN 1988-600: Codes of practice for potable water installations – Part 600: Extinguishing water installations in connection with fire fighting and fire protection installations; DVGW code of practice; 2010-12
- DIN EN 806-1: Specifications for installations inside buildings conveying water for human consumption – Part 1: General; German version EN 806-1:2001 and A1:2001; 2001-12
- DIN EN 806-2: Specification for installations inside buildings conveying water for human consumption – Part 2: Design; German version EN 806-2; 2005-06
- DIN EN 806-3: Specifications for installations inside buildings conveying water for human consumption – Part 3: Pipe sizing - Simplified method; German version EN 806-3; 2006-07
- DIN EN 806-4: Specifications for installations inside buildings conveying water for human consumption – Part 4: Installation; German version EN 806-4; 2010-06
- DIN EN 806-5: Specifications for installations inside buildings conveying water for human consumption – Part 5: Operation and maintenance; German version EN 806-5; 2012-04
- DIN 14461-1: Delivery valve installations for firefighting purposes – Part 1:

Wall hydrants with semi-rigid hose; 2003-07
- DIN 14461-2: Delivery valve installations – Part 2: Filling station and output system connected with dry water conduit for fire extinguishing; 2009-09
- DIN 14461-3: Delivery valve installations for firefighting purposes – Part 3: Fire hose valves for nominal pressure PN 16; 2006-06
- DIN 14461-4: Delivery valve installations for firefighting purposes – Part 4: Filling valves PN 16 connected with firefigthing pipes; 2008-02
- DIN 14461-5: Delivery valve installations for firefighting purposes – Part 5: Tap PN 16 connected with firefigthing pipes; 2008-02
- DIN 14461-6: Delivery valve installations for firefighting purposes – Part 6: Wall hydrants with flat hose for trained personnel DIN EN 671-2; 2009-09
- DIN 14462: Water conduit for fire extinguishing – Planning, installation, operation and maintenance of fire hose systems and pillar fire hydrant and underground fire systems; 2012-09
- DIN 14463-1: Water systems for fire extinguishing – Filling and draining devices operated by remote control – Part 1: For hose reel systems; 2007-01
- DIN 14463-2: Filling and draining devices operated by remote control – Part 2: For water extinguishing systems with empty and non-pressure pipeline network; Requirements and testing; 2003-07
- DIN 14463-3: Water systems for fire extinguishing – Filling and draining devices operated by remote control – Part 3: Valves for ventilation PN 16 of fire extinguishing pipe systems; 2012-09
- DIN 14464: Assembly with direct connection for sprinkler systems and extinguishing systems with open nozzles – Requirements and testing; 2012-09
- VDI/DVGW 6023: Hygiene in potable water installations – Requirements for planning, execution, operation and maintenance; 2013-04
- Association for Sanitation, Heating and Air Conditioning (ZVSHK) potable water hygiene; T88/1: specialist information – technical measures for compliance with potable water hygiene; 2012-05

Protective goal of potable water quality

Fire extinguishing systems are supplied with either potable or non-potable water. In the case of direct connection to the potable water supply, they are subject to particular hygienic requirements (see DIN 1988-600, 2010). Extinguishing water is generally assigned to Class V (DIN EN 1717 and DIN 1988). In order to compensate for deteriorations in the potable water quality due to stagnation, only type S wall hydrants may be attached directly to the potable water installation. Incorrectly planned and executed fire extinguishing systems can result in major problems in terms of potable water hygiene in a building and thus also to health problems. Risk factors exist for the following reasons
- physical – due to temperature increase
- chemical – due to metal ion concentration
- microbiological – due to stagnation

Standards and their implementation are designed to maintain potable water quality. This protective goal can be achieved by

- Separation of the extinguishing water and the potable water supply
- Avoidance of direct extinguishing water connections to the potable water supply
- Safe separation of the systems via a free outlet type AA or AB according to DIN EN 1717; 2011-08
- Avoidance of stagnation in potable water pipelines
- Increase in potable water flow

Since fire extinguishing systems are only operated very rarely, for new systems in connection with potable water installations, the following approach must be taken:
To avoid hygiene problems due to germs, when planning, constructing and operating the system, it must be ensured that there is no stagnant water or that such water cannot enter the potable water installations under any circumstances.
Stagnant water can be prevented by

- Arrangement of consumers according to user behaviour – in series installations frequently used extraction points should be at the end of the installation
- Guarantee of regular extraction of potable water
- Precise dimensioning of the pipelines
- Supply to extinguishing water and potable water pipelines for a site via a joint connection line
- Connection of potable water pipeline directly upstream of the extinguishing water transfer point
- The supply lines to extinguishing water connections must be rinsed once per week – 1.5 x volume of the line content with 20 to 50% of the design volume flow
- Secure fire extinguishing and fire protection systems vis-à-vis potable water systems according to DIN EN 1717; 2011-08

Fire extinguishing system wet and wet/dry
Wet and wet/dry fire extinguishing systems are to be implemented according to DIN 14462.
The potable water pipeline is used as an extinguishing water pipeline up to the extinguishing water transfer point.

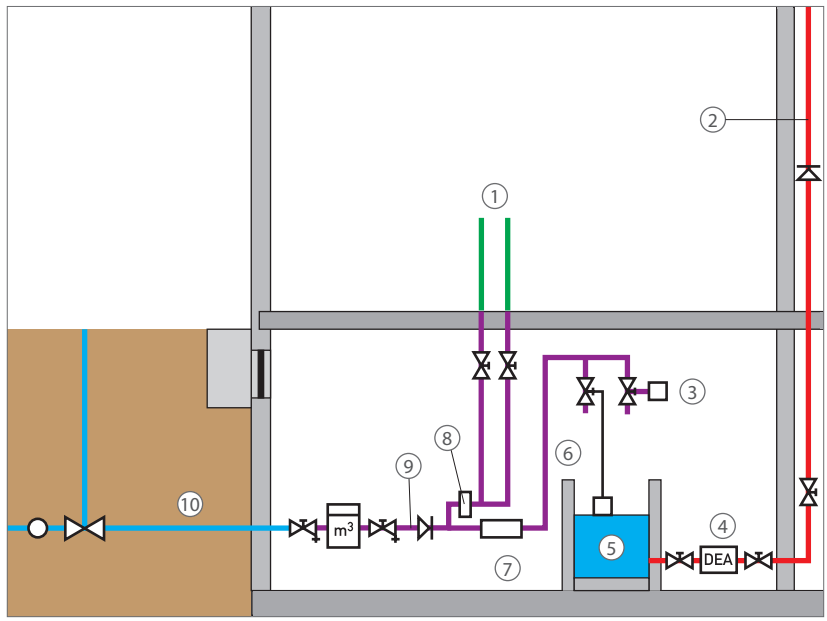


Fig. 153: Extinguishing water transfer point with direct connection to the potable water installation

1 Non-flammable (A) and flammable (B1/B2) installation pipes are permitted. Pipes must not be laid behind the flammable wall coverings of installation walls. The exposed laying of flammable pipes is to be avoided. In the event of fire, a sufficient supply of extinguishing water must be guaranteed.
2 Non-flammable wet or dry extinguishing water pipelines according to DIN 14462
3 Rinsing system
4 Pressure increasing system acc. to DIN 14462
5 Intermediate container with free outlet type AA or AB
6 Non-flammable potable water and extinguishing water pipelines acc. to DIN 1988-600 to supply the intermediate container
7 Stone trap
8 Filter / domestic water station
9 Potable water installation acc. to DIN 1988 Part 600 with additional requirements acc. to DIN 14462
10 Supply line

When designing the wet and wet/dry fire extinguishing systems, the loss of pressure and required nominal pipe diameters must be determined. The possible calculation methods are described in DIN 1988-300 / EN 806-3 or, alternatively, the Hazen-Williams equation can be used.
The following should be taken into account for the planning data

- Extraction volume of 100 or 200 l/min, according to the fire protection concept
- Minimum flow pressure of 0.3 or 0.45 MPa
- Flow pressure of max. 0.8 MPa at the extraction point with simultaneous extraction at three unfavourable extinguishing water extraction points.
- Stagnation pressure of max. 12 bar at hydraulically favourable hydrants (nominal pressure PN 12) according to DIN 14461 Part 1, 6
- Hose connection valve DN50

For wet/dry fire extinguishing systems, the time required to fill the empty pipeline network is also to be calculated and certified for acceptance. According to DIN 14462 after 60 seconds extinguishing water must be available at the extraction point which is furthest away from the extinguishing water transfer point. Usually this means that the flow volume of the pump systems must be measured according to the filling volume flow or the reservoir size must be able to handle this filling quantity.

Fire extinguishing system dry
Dry fire extinguishing systems are to be designed in accordance with DIN 14462. Supply fittings are to be equipped acc. to DIN 14461 Part 4, and extraction fittings acc. to DIN 14461 Part 5.
The dimension of the extinguishing water line must be DN80. If smaller nominal widths or lengths of > 100 m are used, sufficient dimensioning must be demonstrated mathematically. At the same time, it must be ensured that with simultaneous extraction of 300 l/min from two hydraulically unfavourable extraction fittings and a supply pressure of 10 bar, a flow pressure of at least 0.45 MPa is achieved.
Calculations can be performed using the Hazen-Williams equation or as described in DIN 1988-300 / EN 806-300.

Materials
The permitted pipe materials for fire extinguishing systems can be found in the Tab. 61 on page 112.

Commissioning
Before commission fire extinguishing systems they have to undergo an acceptance inspection according to DIN 14462 by a specialist.

Pipe material	Regulations Pipes	Standard connection techniques	Regulations connectors	Regulations Pipe connections
Galvanised ferrous materials	DIN EN 10255 DIN EN 10240 DIN EN 10305-3	Threaded connection	–	DIN EN 10242
		Clamp connection Press connection	–	
stainless steel	DVGW GW 541	Press connection	–	DVGW W 534
		Clamping ring screw fitting	–	DVGW W 534
copper	DIN EN 1057 DVGW GW 392	Brazed connection	DVGW GW 6, DVGW GW 8 DIN EN 1254-1 DIN EN 1245-4 DIN EN 1254-5	DVGW GW 2
		Welded connection	DIN 2607 DIN EN 14640	
		Press connection	DVGW W 534 DIN EN 1254-7	
		Clamping ring screw fitting, metallic sealing	DVGW W 534 DIN EN 1254-2 DIN EN 1254-4	
		Plug connection	DVGW W 534	
Internally tin-plated copper	DIN EN 1057 DVGW GW 392	Press connection	DVGW W 534	
		Clamping ring screw fitting, metallic sealing	DVGW W 534 DIN EN 1254-2 DIN EN 1254-4	
		Plug connection	DVGW W 534	

Tab. 61: Permitted pipe materials for fire extinguishing systems according to DIN 14462

Potable water installations with wall hydrants

Execute potable water installations with wall hydrants according to DIN 1988 or EN 806 whereby the potable water pipeline is used as the extinguishing water line up to the last extinguishing water extraction point.

When designing and setting up potable water installations with wall hydrants the pressure loss and the necessary nominal pipe diameters according to DIN 1988-300 or EN 806-3 must be calculated.

The following should be taken into account for the planning data

- Extraction flow volume 24 l/min
- Minimum flow pressure 0.2 MPa
- Max. flow pressure at the extraction point with simultaneous extraction at two unfavourable extinguishing water extraction points 0.8 MPa
- Max. stagnation pressure at hydraulically favourable hydrants – nominal pressure PN 12 according to DIN 14461 Part 1 1.2 MPa
- Hose connection valve with integrated safety combination DN25

DIN 1988 enables the use of flammable materials such as plastic pipes. They should only be used as extinguishing water lines if placed underground or used in house connection rooms without fire loads.

Sprinkler systems

The following information is in addition to the application parameters and limits for the various systems in the respective product sections and must be taken as a whole.

Overview of Viega systems

Sprinkler systems are fixed, automatically triggered fire extinguishing systems which are able to slow down the expansion of or indeed prevent fires thanks to the targeted deployment of extinguishing water when a fire occurs. Sprinkler systems are subject to the supervision of specialist certification bodies. The following ZdS certificates are available for the Profipress, Sanpress Inox, Megapress and Prestabo hot dip galvanised installation systems.

- Profipress (VdS certificate G4980009)
  DN20 to DN50, in connection with copper pipes according to DIN EN 1057 R290 (hard)
- Sanpress Inox (VdS certificate G4070017)
  DN20 to DN100 in connection with stainless steel pipes 1.4401 and 1.4521
- Prestabo hot dip galvanised (VdS certificate G4090017)
  DN20 to DN100 in connection with hot dip galvanised Prestabo pipes according to DIN EN 10305
- Megapress (VdS certificate G414021)
  DN20 to DN100 in connection with thick-walled steel pipes

Fig. 154: Sprinkler with glass ampoule

	Profipress	Sanpress Inox	Prestabo hot dip galvanised	Megapress
Area of application	Wet fire extinguishing system	Wet fire extinguishing system wet/dry dry	Wet fire extinguishing system	Wet fire extinguishing system wet/dry dry
Pipe	Copper, in accordance with DIN EN 1057 R 290 (hard)	Stainless steel 1.4401 or 1.4521	Internally and externally galvanised steel pipe	Black steel pipes, galvanised, industrially painted or powder-coated
Nominal diameter	DN20 22 x 1.0 mm DN25 28 x 1.5 mm DN32 35 x 1.5 mm DN40 42 x 1.5 mm DN50 54 x 2.0 mm	DN20 22 x 1.5 mm DN25 28 x 1.5 mm DN32 35 x 1.5 mm DN40 42 x 1.5 mm DN50 54 x 1.5 mm DN65 76.1 x 2.0 mm DN80 88.9 x 2.0 mm DN100 108.0 x 2.0 mm	DN20 22 x 1.5 mm DN25 28 x 1.5 mm DN32 35 x 1.5 mm DN40 42 x 1.5 mm DN50 54 x 1.5 mm 64.0 x 2.0 mm DN65 76.1 x 2.0 mm DN80 88.9 x 2.0 mm DN100 108.0 x 2.0 mm	¾ (DN20) 1 (DN25) 1¼ (DN32) 1½ (DN40) 2 (DN50) 2½ (DN65) 3 (DN80) 4 (DN100)
Press connectors	Copper and gunmetal or silicon bronze	stainless steel	Galvanised steel	Non-alloyed steel
Sealing element	EPDM	Wet fire extinguishing system: EPDM Wet/dry systems: FKM Dry system: FKM	EPDM	≤ DN50 EPDM > DN65 FKM
Pressure range	1.6 MPa	DN20 to DN65: 1.6 MPa DN80 to DN100: 1.25 MPa	DN20 to DN65: 1.6 MPa DN80: 1.25 MPa DN100: 1.0 MPa	DN20-DN65: 1.6 MPa DN80: 1.25 MPa DN100: 1.0 MPa
Certificate	VdS: G 4980009	VdS: G 4070017	VdS: G 4090017	VdS: G414021
Fire hazard classes according to VdS CEA 4001	LH, OH1 - OH3, OH4 restricted to exhibition halls, cinemas, theatres, concert halls	LH, OH1 - OH3, OH4 restricted to exhibition halls, cinemas, theatres, concert halls	LH, OH1 - OH3, OH4 restricted to exhibition halls, cinemas, theatres, concert halls	LH, OH1 - OH4, HHP1 - HHP4 and HHS I - HHS IV
Note		No certification for pipe size 64.0 mm		Wall thickness DN20–DN50 2.6 to 3.3 mm DN65 2.6 to 4.5 mm DN80 2.9 to 5.0 mm DN100 3.2 to 5.4 mm

Tab. 62: Sprinkler systems in accordance with VdS guidelines

Planning/fundamentals

Function and operating mode

Sprinkler systems are permanently installed devices for automatic fire fighting. Sprinklers installed on storey floors are triggered by the change in temperature in the event of a fire and thus reduce risks to humans and damage to property.
The advantages of a sprinkler system lie in the spatially limited and effective use of extinguishing agents at an early stage in the course of the fire.
Preferred application areas

- Office and administration buildings
- Hospitals and old peoples' homes
- Hotels
- Schools and universities
- Underground garages and car parks
- Industrial units

Alongside glass bulb sprinklers, fusible link sprinklers are also common for special applications. The various types cover all possible on-site situations and requirements, ranging from their positioning on ceilings, wall and floors and also with reference to the spraying properties and extinguishing performance in litres per minute.
They are designed by specialists taking the hydraulic and extinguishing criteria into account.

Glass bulb sprinklers

Sprinkler heads with glass ampoules are mostly installed at defined intervals on the storey floor and are integrated into a fire extinguishing and fire protection installation. The sprinklers' jet openings are sealed with glass ampoules which burst due to the thermal stress in the event of a fire and release the pressurised extinguishing agent.
The trigger temperature for the sprinkler heads should be approx. 30 °C above the maximum expected room temperature and can be set exactly between 57 °C and 182 °C by using different glass ampoule types (colour coded).

Fig. 155: Colour coded sprinklers with glass ampoules

Trigger temperature [°C]	Marking	Use
57	orange	Standard
68	red	
79	yellow	Special
93	green	
141	Blue	
182	light violet	

Tab. 63: Opening temperature classification

Water performance – K factor
Given the wide range of possible applications, sprinklers with varying extinguishing parameters are required. The so-called water performance is determined by the opening diameter of the sprinkler which is defined as the K factor in the formula

$$Q = K \cdot \sqrt{p}$$

With
Q = Water volume in l/min
K = Outflow factor of the sprinkler at 0.1 MPa
P = Sprinkler pressure in bar
The minimum pressure is 0.05 MPa, the maximum permitted pressure is 0.5 MPa.

K factor	Thread [R]	Use	Min. performance at 0.05 MPa [l/min]
57	⅜	Low fire load	40.0
80	½	Standard	57.0
115	¾		81.3
160–202	¾	Large drip sprinkler 0.31 MPa	281.7–355.7

Tab. 64: K factors for sprinklers in line with the installation situation

Example
A sprinkler R½ with K = 80 achieves at 0.1 MPa (1 bar)
$Q = 80 \cdot \sqrt{1} = 80\,l/min$

At 0.2 MPa (2 bar) the same sprinkler achieves
$Q = 80 \cdot \sqrt{2} = 113\,l/min$

Nominal K factors are influenced by the sprinkler angle used. The influences upon the K factor must be taken into consideration in the hydraulic calculation and in the system layout.

Nominal K factor	Total K factor including sprinkler angle
K-80	K-69
K-57	K-53

Tab. 65: Sprinkler use

Mounting instructions

Planning and installation

During the planning, installation and commissioning of sprinkler systems, the following points, amongst others, are to be taken into consideration:

- Applicable and agreed regulations as well as the recognised rules of engineering
- Deviating country-specific requirements and regulations
- Product information provided by the manufacturer

The design of the pipeline network must be such that it is possible to empty and that every area can be drained fully and at any time. Any reverse incline in the pipelines must not mean that water can remain in the system after draining.
If jumps in the pipelines are required, e.g. at a concrete lintel, a suitable draining option must be provided at the deepest point.
According to VdS CEA 4001 section 13.6 rinsing connections must be placed at the end of all secondary distribution pipes via which the pipeline network can be rinsed and aerated. Depending on the installation design, it may be necessary to fit further pipeline sections with bleeder valves.

Commissioning

A pressure test must be carried out before commissioning the system. The pipeline network must be easily and fully accessible for the pressure test and must not be concealed.
If the system is not put into operation immediately after the pressure test, the pressure test must be performed with oil-free compressed air/inert gases.

Procedure for the pressure test

1. Visual inspection of the complete system for obvious flaws – thorough rinsing of the entire pipeline network required.
2. Completely fill the system with the test medium, such as inert gases/oil-free compressed air/filtered potable water according to the DWO.
3. Perform the pressure test according to the generally recognised rules of engineering (e.g.: VdS CEA 4001, section 17).
4. Document the results of the pressure test in a log.
5. Have an authorized expert sign the log, and provide it to the customer.

Fixing technology

The following must be noted for the execution and fixing of extinguishing water pipelines and lines to extinguishing water transfer points

- Planning of connection line lengths according to DIN 1988-600
- The laying of extinguishing water lines in pipe routes is permitted
- The use of plastic dowels is not permitted
- Installation based on DIN 4102 Part 4 in connection with DIN V 4102 Part 21
- Ensure the stability of the fixing points in accordance with the expected duration of use – 2 hours in accordance with DIN 14462
- Design fixing points and fixing structures (crossbeams, crane arms etc.) according to the expected duration of use and, if relevant, apply a fire protection wall coating

Special requirements may be specified in the course of the construction approval process whilst taking the principle of proportionality into account. These requirements are specified in the fire protection concept or the construction regulations.

Fixations are to be made of steel and designed without flexible connecting links and are to be dimensioned so that the mathematical stresses do not exceed the limit values in the table below. Suspension components must be at least 1.5 mm thick.

Load	Fire resistance class according to DIN 4102-4	
	L30 or L60	L90 or L120
Tensile stress σ in vertical parts [N/mm²]	9	6
Shear stress τ in screws of strength class 4.6 according to DIN EN ISO 898-1 [N/mm²]	15	10

Tab. 66: The approved stresses in suspensions correspond to the fire resistance class

Horizontal extinguishing water lines may only be fixed to beams or ceilings with the same fire resistance duration. The use of plastic dowels in fire protection systems is not permitted.

If dowels are used for fixation, the various requirements for dowels with and without fire protection proof of suitability must be noted.

According to DIN 14462 brackets must generally be at a distance of max. 4 m with galvanised ferrous materials and stainless steel with a wall thickness of > 2.6 mm.

With copper pipelines and pipelines made of galvanised ferrous materials and stainless steels with a wall thickness of < 2.6 mm, the fixation spacing is 2 m.

The various specifications of the fixation technique given in the regulations apply for sprinkler systems.

Fixing points

The forces resulting from the length expansion of the fire extinguishing lines due to the impact of fires must not destroy the firewalls. That is why fire extinguishing lines must be fixed in place at a sufficient number of points in order to divert these forces in a controlled manner via expansion compensators (L or U pipe) or compensators.
The general installation principles in section "Metal potable water installation systems – application technology" in the Viega practice manual apply.
Additional fixing points must be provided in "wet/dry" and "dry" extinguishing water lines in order to compensate for the reaction forces of the extinguishing water line during the filling process.
These additional fixing points must be located on the connection of pressure booster systems on the pressure side and on remote-controlled filling and emptying stations (wet/dry stations) according to DIN 14463.
Standard structures made of non-flammable building materials have proved to be effective for the fixing points, e.g. pipe bows.

Use of dowels

In terms of the quality and execution of fixations with dowels **without** fire protection proof of suitability the following applies

- Steel material
- Minimum size M8
- Installation depth = at least twice the dowel length
- Max. mathematical tensile loading = 500 N

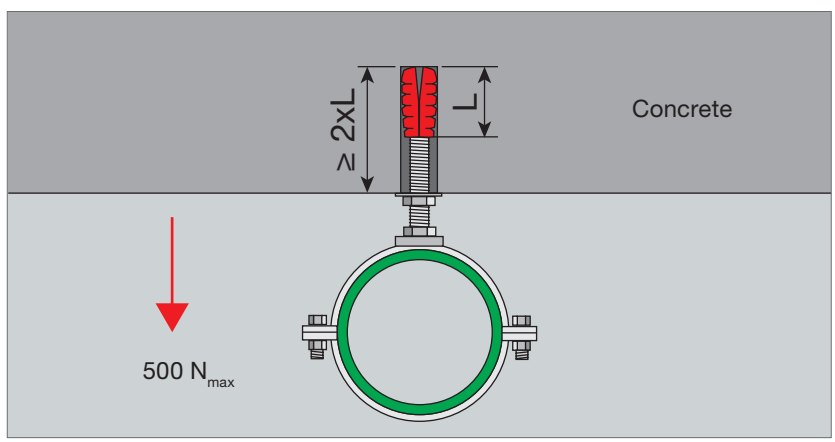


Fig. 156: Steel dowel without fire protection proof of suitability

The maximum load and installation type for dowels **with** fire protection proof of suitability are defined in the proof of suitability documentation.

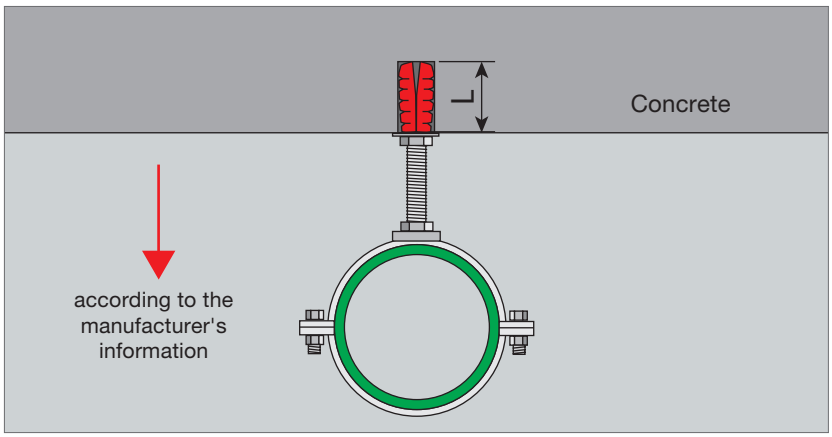


Fig. 157: Steel dowels with fire protection proof of suitability

In both cases, the permitted fixing distances according to the manufacturer's information must be observed.
When fixing extinguishing water lines onto steel components with fire protection cladding, force-fit fixing elements are to be used instead of dowels. The above limit for mathematical tension must be observed. The fire protection cladding of the steel components is to be extended to a length of at least 300 mm on the suspension. This prevents the fire resistance duration of the steel components being impaired by connection of the suspending brackets. The length of the suspension (distance from bottom edge of the fire extinguishing line and bottom edge of the ceiling) must not exceed 1.5 m with unprotected suspending brackets.

Fire protection cladding for pipelines

Extinguishing water lines and the supply line to the extinguishing water transfer point are to be designed according to the expected duration of use of 2 hours according to DIN 14462.
Extinguishing water lines and wall brackets must be dimensioned and protected so that they do not exceed the critical temperature for mechanical loading of 500 °C in the event of a fire. This is the only way to ensure the functionality of the extinguishing system even when it is subjected to additional maximum loads, e.g. from falling objects.
When laying dry and wet/dry extinguishing water lines in areas with high fire loads, additional measures must be taken.

Installation site	Measures
In fire load-free stairways, lock systems and escape routes	None
In areas with automatic extinguishing systems (e.g. sprinkler extinguishing system)	Coordination with the fire protection concept and local fire protection authorities

Installation site	Measures
In areas with fire loads	Cladding of the pipeline according to DIN 4102-4 or equivalent

Tab. 67: Fire protection measures for extinguishing water lines

The following can be used for the fire protection cladding of extinguishing water lines
- Exposed and metal-concealed fire protection pipe casing
- Mineral fibre wool according to DIN 4102 Part 4
- Approved fire protection systems made from other construction materials

The cladding thickness must be selected separately for each component in line with the general building supervisory approval for piping systems.
If, on the basis of the calculated loads, there are tensile loads in the brackets which are well in excess of 6 N / mm², in accordance with the basic rules outlined in DIN 4102-4, the suspending brackets must also be cladded.

Commissioning

Pressure test report

In line with the requirements of DIN 14462, extinguishing water lines, including their fittings, are to be subjected to strength and leakage tests before commissioning.

System control book

Furthermore, a control book is to be created for the fire extinguishing system with the following information
- Installation site/address
- Owner's address
- Operator's address
- Installation company's address
- Competent water supply company
- Constructional requirements and planning fundamentals
- Technical documents for the components used
- System diagram with wall hydrants, feed-in and extraction fittings as well as other key components
- Pipeline dimensions
- Flooding time calculation for dry or wet/dry fire extinguishing systems
- Record: Pressure/leakage test
- Record: Rinsing
- Record: Instructing of the operator by the installation company
- Installation company's declaration of compliance
- Acceptance test
- Records on servicing work
- Records on maintenance performed
- Records on malfunctions and their causes

Compressed air systems

Fundamentals

Compressed air properties

Atmospheric air can be compressed through the use of energy (see Fig. 158) W_1 – this results in heat (T) and compressed air (W_2) which can be used as an energy carrier for performing work.
Since, when generating compressed air, around 95% of the energy used is converted to heat, in economic systems, in addition to the compressed air system, there is always a further system which uses this waste heat.
All techniques for drives and processes which use compressed air as an energy carrier for performing work are referred to as "pneumatic".

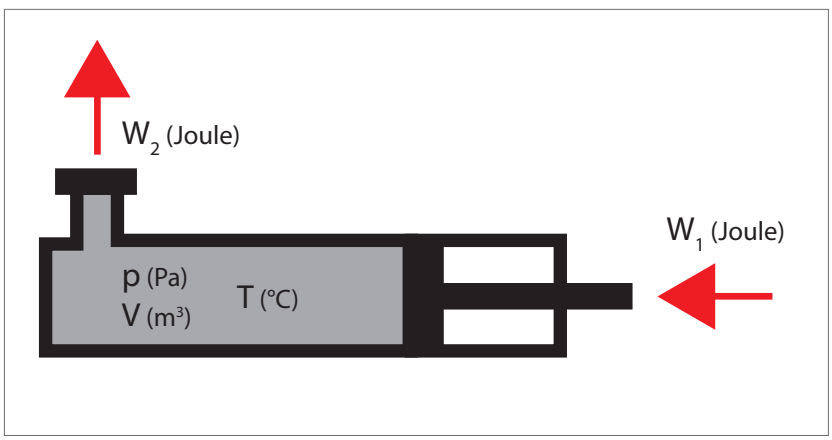


Fig. 158: Principle of compressed air generation

Despite the disadvantages as regards the energy balance, the use of compressed air, particularly in the industrial sector, offers numerous advantages.

- **Central provision and distribution**
  The compressed air generated by the centrally installed compressors can be distributed via a pipeline network.
- **Storability in tanks**
  Compressed air can be delivered in tanks of all sizes – mobile and stationary – even to exposed sites.
- **Weight of drives**
  Drives operated with compressed air are lighter than electrical ones – advantages with hand-held tools.

- **Cleanliness**
  Residue-free use with advantages for use in the food, textile, paper and packaging industry.
- **Operational safety**
  Compressed-air devices are spark-free and can therefore also be used in areas at risk of fire and explosions.
- **Quick cycles**
  High flow speeds of >20 m/s enable quick switching times for valves and high working speeds for machines.
  - Valve switching time at 6 bar approx. 50 m/s
  - Piston speed in pneumatic cylinder approx. 15 m/s.
- **Adjustability**
  The forces, torques and speeds of drive and control elements can be easily adapted to the requirements using pressure and flow rate controllers.

Compressed air qualities according to ISO 8573-1

A high compressed air quality contributes greatly to the cost effectiveness of the system and to production safety. Furthermore,

- it increases the product quality
- prevents damage to machines and tools and
- reduces wear.

To ensure smooth-running production processes, there must always be sufficient amounts of compressed air of consistent quality and at sufficient pressure. The long-term functionality of a compressed air system is dependent on maintenance tailored to the operational requirements.
Industrial sectors have formulated their requirements as regards compressed air qualitities in ISO 8573-1 as classes – Examples

- Class 1
  - Analysis technology
  - Pharmaceutical and foodstuff production
  - Optical devices
- Class 2
  - Packaging industry
  - Paper and fabric production
- Class 3
  - General industrial production
- Classes 4 and 5
  - Trade
  - Heavy industry
- Class 6
  - Compressed air without requirements

Class	Maximun number of particles[1] per cubic metre / Mass concentration C_P [mg/m³]			Pressure dew-point [°C] / Concentration of liquid water C_W [g/m³]	Concentra-tion of total oil [mg/m³]
	0.1–0.5 µm	0.5–1 µm	1–5 µm		
0	As specified by the equipment user or supplier and more stringent than class 1				
1	≤ 20,000	≤ 400	≤ 10	≤ -70 °C	≤ 0.01 mg/m³
2	≤ 400,000	≤ 6,000	≤ 100	≤ -40 °C	≤ 0.1 mg/m³
3	Not specified	≤ 90,000	≤ 1,000	≤ -20 °C	≤ 1 mg/m³
4		Not specified	≤ 10,000	≤ 3 °C	≤ 5 mg/m³
5			≤ 100,000	≤ 7 °C	
6	≤ 5 mg/m³			≤ 10 °C	
7	5–10 mg/m³			≤ 0.5 g/m³	
8				0.5–5 g/m³	
9				5–10 g/m³	
X	> 10 mg/m³			> 10 g/m³	> 5 mg/m³

Tab. 68: Compressed air purity classes in accordance with ISO 8573-1

[1] Should the measured particles exceed 5 µm, classes 0–5 cannot be used.

Planning

Specialist companies which develop customised concepts for the specific cases handle the planning of compressed air systems. The framework conditions are complex and must be considered as a whole to arrive at a cost-effective solution.
The components and functions of compressed air systems are presented below should they be of relevance when selecting materials. Reference is made to the suitable piping systems and special features during execution in the corresponding places.

Requirements of compressed air systems

The system components are selected based on the system requirements. They relate to

- the nature of compressed air generation – compressor type
- provision – centralised or decentralised
- the nature of heat usage or recovery
- the nature of storage – storage type
- the nature of compressed air processing – system type
- the piping system – material and execution

The following is required when designing the compressor type

- the sum of the required compressed air amounts
- the necessary reserve air amounts
- the necessary operating pressure
- Details on planned future use

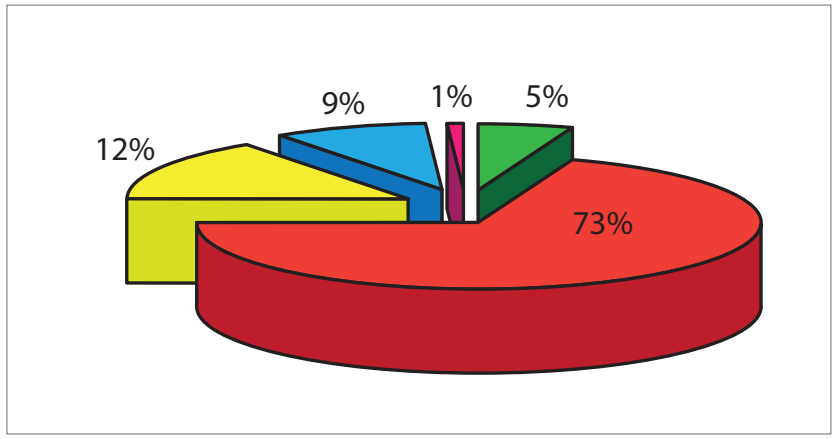


Fig. 159: Energy balance of compressed air preparation

Compressor cooling
Motor loss
Compressed air
Post cooling
Radiation

Energy balance

Compressors produce up to 95% heat. Only around 5% of the energy employed can be used as working energy via the compressed air. Economic and ecological aspects encourage the maximum possible recovery of compressor waste heat. There are in essence two options for waste heat utilisation

- Direct – as hot air heating
- Indirect – as a hot water heater via a heat exchanger

With the full and comprehensive employment of all waste heat flows for direct waste heat utilisation as hot air heating, around 94% of the electrical energy employed can be put to use and around 85% for the hot water supply.
Since the use of the waste heat for hot air heating is only viable in the cold months, the waste heat is normally used for the hot water supply.

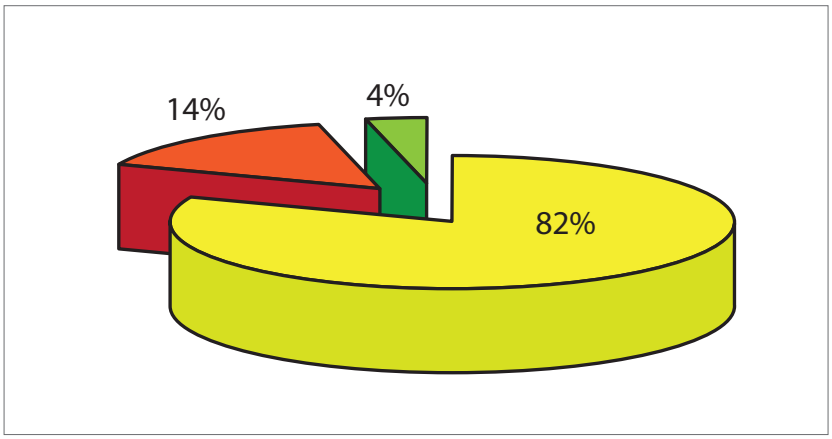


Fig. 160: Cost allocation without heat recovery

Energy costs
Maintenance costs
Investment costs

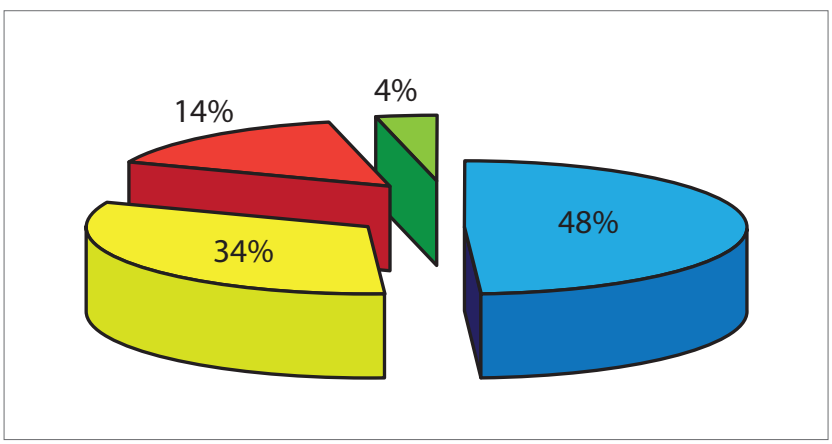


Fig. 161: Cost allocation with heat recovery

Energy costs
Maintenance costs
Investment costs
Savings thanks to heat recovery

Maintenance

The maintenance costs for compressed air systems should not exceed approx. 8% of the investment costs and essentially depend on the compressed air quality requirements.
The preventive maintenance which is normal in operations and compliance with the maintenance intervals reduce costs to the unavoidable minimum and prevent expensive repairs during production periods.

System components

Compressed air systems can be divided into three system parts
- Compressed air generation – ① Compressor with heat recovery
- Compressed air reprocessing – ② Storage, cleaning
- The piping system – ③ Distribution

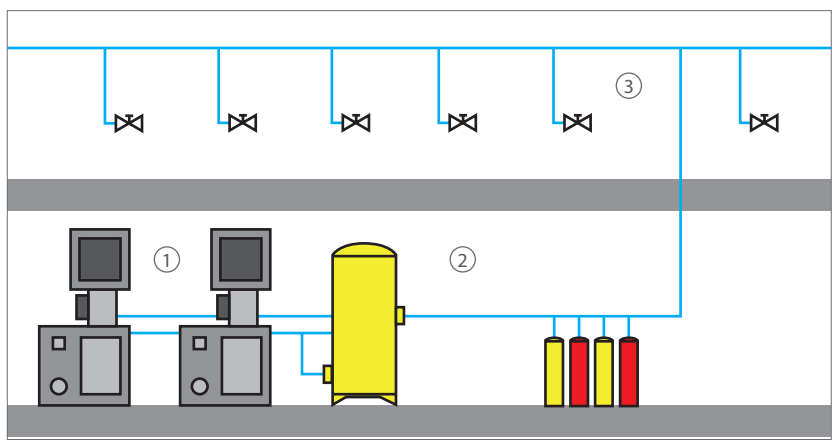


Fig. 162: Components of a compressed air system

Compressed air generation

Depending on the amounts of compressed air required and the pressure levels, different types of machines are used to produce compressed air.

Ventilator
For large air quantities at low pressure:
Due to their shape, rotating propeller blades create an air flow which is mostly directly in the working area.
Use: For cooling

Radial compressor
For minimum air quantities at medium pressure:
Air is guided to the centre of a rotating rotor and is propelled to the periphery due to the centrifugal force. The pressure increase is achieved by guiding the accelerated air through a diffuser before it reaches the next rotor. The kinetic energy (speed energy) is thereby converted into static pressure.
Use: Turbo charger in cars

Axial compressor
For large air quantities at medium pressure:
The air alternatively flows through a series of rotating and stationary blades. The air is initially accelerated and then compressed. The blade channels form diffuser-like expanded channels in which the kinetic energy created via circulation stalls the air and converts it into pressure energy.
Use: Aircraft turbines

Compressor
For medium and large air quantities at high pressures:
The compressing of suctioned in air using pistons, often over several stages during storage, until the required operating pressure is achieved – plunger and screw compressors.
Use: Storage of large quantities of air in small stores (scuba tanks) or central compressed air provision with long transport routes

Industrial building directive

- The operating room for compressors with a motor output in excess of 40 kW must feature special fire protection.
- Compressors with a motor output in excess of 100 kW must be set up in a separate, fire-resistant room.

Requirements for fire-resistant operating rooms

- Walls, ceilings, floor structures and doors must comply with at least Fire Resistance Class F30.
- No flammable liquids may be stored.
- The floor structure around the compressor must be made of non-flammable material.
- It must not be possible for leaking oil to spread over the floor.
- There must be no flammable materials within a three metre radius of the compressor.
- There must be no flammable system parts above the compressor (cable trays, plastic pipes etc.)

Compressed air reprocessing

Multi-stage compressors based on the piston compressor principle have proven themselves effective for the central supply of industrial compressed air installations with large quantities of compressed air, it should be noted here that the operating pressures are mostly below 1.0 MPa.
Compressors suction in air from the surroundings and compress this to the required operating pressure. Depending on where they are set up, the air can contain pollution such as soot, dust, machine emissions and humidity which has to be removed before the air is fed into the compressed air installation. Pollution increases proportionately to the level of compression – with production of 1.1 MPa compressed air the increase is 10-fold.
The aim of compressed air reprocessing is, in addition to the removal of oil and dirt, to reduce air moisture. Energy-saving cold drying is used mostly for financial reasons.
Reprocessing is based on the specified requirements. In accordance with ISO 8573-1 the compressed air is divided into classes with the corresponding requirements *(see page 124)*. However, it is not essential to satisfy all the conditions of a requirement class. For example, the residual oil content of Class 1, the residual water content of Class 3 and the particle size and number according to Class 2 can be set as requirements for the operator. As such, reprocessing must be planned and executed on a case by case basis. Compressed air installations in areas at risk of frost are fitted with an absorption dryer instead of a cold dryer.

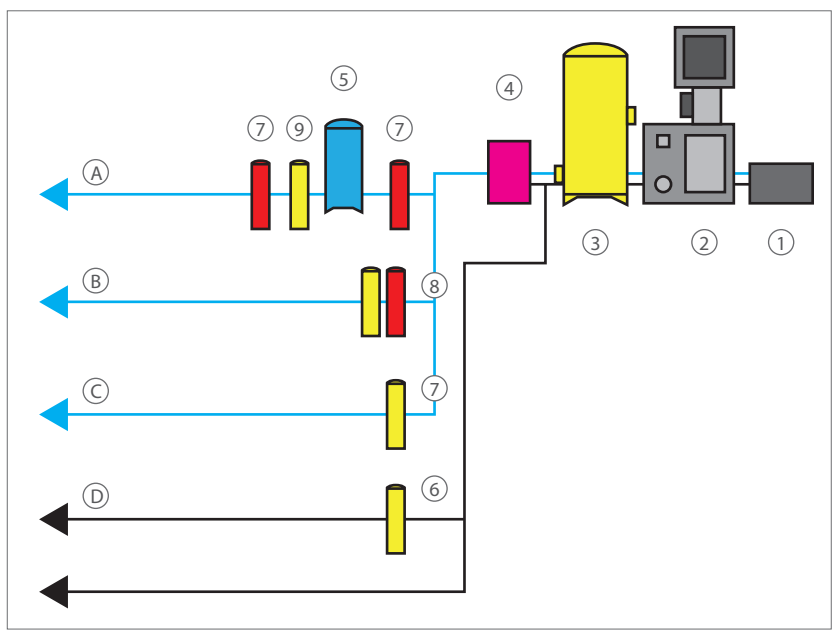


Fig. 163: Compressed air reprocessing with ultra-pure air quality

1 Suction air filter
2 Suction air filter
3 Store
4 Cold dryer pressure condensation point +3°
5 Absorption dryer pressure condensation point -70°
6 Pre-filter
7 Micro-filter
8 Micro-/activated carbon filter
9 After-filter
A Clean air Q1
B Clean air Q2
C Normal quality
D Low quality

Air pollution – condensation

In the industrial sector in particular, the quality of the outside air in relation to use for compressed air generation depends on the site. Particles and aggressive components must be filtered out either before being suctioned in by the compressor or, at the latest, during compressed air reprocessing before being fed into the system. If this is not achieved or not done adequately, this has a negative impact on the compressed air installation and the functioning of the connected fittings, machines and devices. Any contaminated compressed air which leaks out can also be harmful to health and impair production quality. Depending on the installation site, a pre-filter for the suctioned in air is to be provided and the extent of compressed air reprocessing is to be tailored to the specific conditions.

Impact of unclean compressed air on system parts

- **Condensate formation from solid particles and oils**
  Premature machine wear from abrasion and corrosion
- **Transport of germs/aggressive chemicals**
  Damage to health from the inhalation of leaking compressed air
- **Oil deposits**
  Cross-section narrowing due to resinification results in reduced system efficiency caused by a loss of performance and energy
- **Water accumulation**
  Leaks are rendered more likely due to electrochemical corrosion; impairment of lubrication systems in connected devices and machines; frost damage

Mixtures of water, oil, greases and the above-mentioned solid pollution which result from the compression of air are referred to as condensates. The mixing of various substances makes compressed air condensate extremely bad for the environment and harmful. The correct disposal of condensate is regulated in the German Federal Water Act. It prescribes in Section 7a that water which contains hazardous substances must be reprocessed in line with the generally recognised rules of engineering.

Wherever condensate accumulates (pressure vessel, filter, dryer), it must be automatically drained away and collected to prevent it from being introduced again into the compressed air flow.

Compressed air storage

Pressure vessels are a core component of any compressed air system. The required vessel size depends on the compressed air requirements and the type of compressor.

Tasks

- Buffer for consumption peaks
- Pulsation damper when using piston compressors
- Condensate separation

Piping system

Compressed air-driven tools, devices, machines and systems are supplied with compressed air via a piping system. The basis for efficient and economic operation is the differentiated dimensioning of the pipeline diameters during the planning and professional execution of the installation. High demands are made as regards the performance of compressed air systems.

- Sufficient amounts of compressed air of consistent quality and pressure must be supplied to each consumer.
- The piping system should be essentially leak-free.
- The piping system should be divided into sections which can be shut off – expansions, maintenance and repairs must not result in failure of the complete system.
- The system must be executed in line with the applicable safety regulations.

A piping system is divided into the sections

- Supply line
- Manifold
- Connection line

It is important to calculate the pressure losses in the individual pipeline sections whereby the total pipe length includes the equivalent pipe lengths for moulded pieces and fittings and is referred to as the "fluidic pipe length".
If the piping route is not known during planning, the fluidic pipe can be estimated by multiplying the straight pipe length by 1.6.
The nominal widths of the individual pipeline sections are determined using a layout diagram whilst taking the air quantity assigned to the pipeline section and the pressure loss to be observed.

Total pressure loss for the compressed air system

The total pressure loss for a compressed air system should not exceed 1 bar for economic and ecological reasons.
With a pressure loss of 1 bar, the system parts can be assigned the following pressure losses on a pro rata basis

- 0.01 MPa Pipeline network with main, manifold and connection line
- 0.07 MPa Provision with drying, cleaning, storing, main line connection
- 0.02 MPa Reserves, tool and machine connection

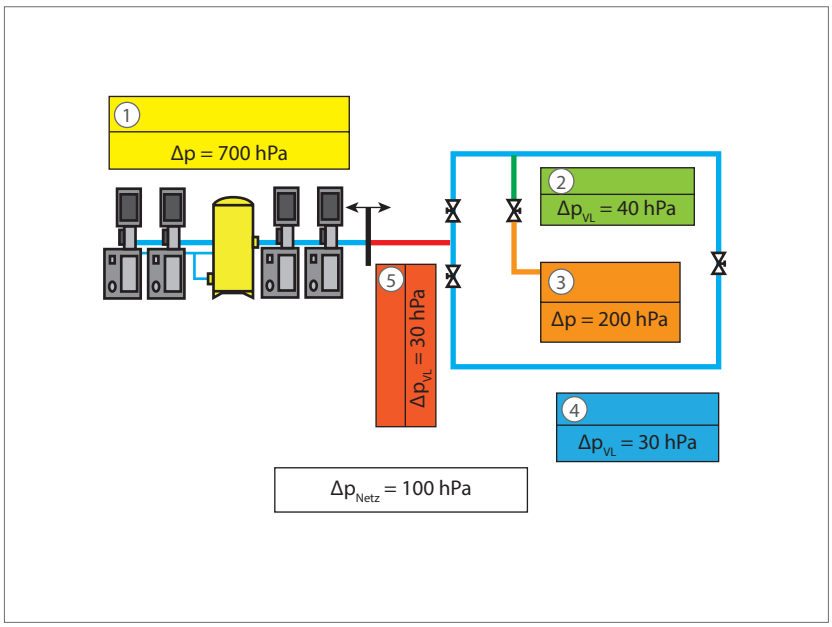


Fig. 164: Pressure loss calculation for the compressed air system

1 Provision
2 Connection line
3 To the consumer
4 Manifold
5 Main line

Piping systems for compressed air installations

Material selection/connecting technology

Compressed air installations should be permanently tight, maintenance-free if possible and dimensioned to suit requirements. Within the scope of planning and material selection for the pipeline installation, it is important to take the individual, mechanical and chemical factors into account.
There is not one sole material which is suitable for use in compressed air systems. The advantages and disadvantages of the materials which are normally used must be weighed up on a case by case basis.

- Comparison of the pipe materials' mechanical and chemical properties
- Influence of pipe material on compressed air quality
- Mounting and fixing requirements for pipelines
- Synergy effects from the use of certain pipe materials, e.g. lower energy consumption due to reduced pipe friction pressure loss, use of press connector systems in other areas (potable water, non-potable water etc.)

The same criteria apply when selecting a suitable pipe connecting technique as when selecting the material. More importance is attached to the use of resources for mounting.
The following is expected of pipe connections

- Components – manageable amount, simple to handle
- Properties – permanently leakproof, high tensile strength, pressure-proof
- Personnel qualifications – no special qualifications required
- Mounting – quick, with only few tools and personnel

Viega press connector systems have been tried and tested in practice and satisfy the relevant demands.
When selecting materials for fittings, pipes and sealing elements, the mechanical and chemical influences depending on the situation must always be taken into account.
Always send inquiries with the form "Inquiry regarding material durability" to the Viega Service Center in Attendorn.

Compressed air	System name		Profi-press	Profi-press S	San-press Inox		San-press		Profi-press G	Sanpress-sInox G	Prestabo		Sea-press	Megapress	
	Pipe material		Copper		Stainless steel				Copper	Stainless steel	Steel		CuNiFe	Thick-walled steel pipe	
					1.4521	1.4401	1.4521	1.4401			galva-nised	hot dip galva-nised			
	Connector material		Copper, gunmetal or silicon bronze		Stainless steel		Gun-metal or silicon bronze		Copper, gunmetal or silicon bronze	Stainless steel	Galvanised steel		CuNiFe	Steel, zinc-nickel coating	
	Sealing element		EPDM	FKM	EPDM				HNBR		EPDM			EPDM	FKM
Comment	p_{max} [MPa]	T_{max} [°C]													
Oil concentration ≤ 25 mg/m³ 12 – 54 mm 64.0 – 108.0 mm	1.6	60	✓	✓	✓	✓	✓	✓	✓	✓	✓ [6]	✓	✓	✓ [6]	✓ [6]
Oil concentration ≥ 25 mg/m³ 12 – 54 mm 64.0 – 108.0 mm				✓					✓	✓ [4]	✓ [1, 6]	✓ [1]	✓ [1]		✓ [6]

Tab. 69: Materials for compressed air installations

[1] Replacement of sealing elements for FKM
[4] In connection with Sanpress pipe 1.4521 and 1.4401
[6] Almost condensate-free

Viega installation systems

The Viega Sanpress/Sanpress Inox and Profipress press connector systems are suitable for use in compressed air systems with operating pressures < 16 bar and an oil concentration in the compressed air of < 25 mg/m³. The comprehensive range of press connectors enables all devices to be connected as well as the transition to conventional installations with threaded connections.

Sanpress / Sanpress Inox / XL system with stainless steel pipe

For use in compressed air installations, Viega recommends two systems with different press connector materials and steel pipe qualities

- Sanpress Inox — Stainless steel press connector
- Sanpress — Gunmetal or silicon bronze press connector

See “Sanpress/XL” on page 21

Pipes

Stainless steel, laser welded, corrosion-proof

- Material no. 1.4401 (X5CrNiMo 17-12-2), with 2.3% molybdenum for increased durability
- Material no. 1.4521 (X2CrMoTi 18-2), with PRE-value 24.1

Sealing elements

EPDM black (ethylene-propylene-diene-monomer rubber); up to 110 °C; not resistant against hydrocarbon solvent, chlorinated hydrocarbon solvents, turpentine, petrol

Features

- Exceptional corrosion resistance
- Hygenically safe
- Able to withstand high mechanical loads
- Smooth pipe surface with low pipe friction pressure loss
- Long service life

Fig. 165: Sanpress Inox installation

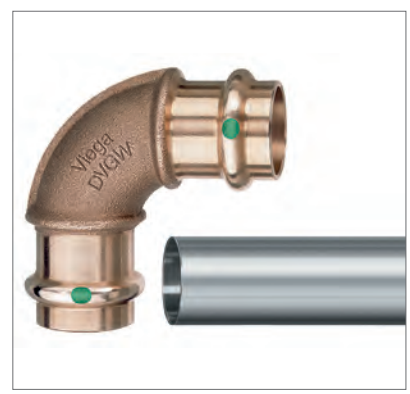


Fig. 166: Sanpress installation

Profipress/XL system with copper pipe
The press connector system with press connectors up to 64.0 mm made of copper and the XL sizes made of gunmetal and silicon bronze used together with the copper pipes and EPDM sealing elements.

Pipes
Copper pipes pursuant to DIN EN 1057

Press connector material
- Standard sizes 12 to 54 mm — copper
- XL sizes 64.0 mm — copper
- 76.1/88.9/108.0 mm — gunmetal or silicon bronze
- Press connector with threaded connection — gunmetal or silicon bronze

See “Profipress/XL” on page 15

Sealing elements
EPDM, black (ethylene-propylene-diene-monomer rubber); up to 110 °C; not resistant against hydrocarbon solvent, chlorinated hydrocarbon solvents, turpentine, petrol

Fig. 167: Profipress installation

Material	Density [kg/dm³]	Breaking strength [N/mm²]	E-modulus [N/mm²]	Heat expansion [mm/mK]	Heat conductivity [W/mK]
	ρ	δ_z	E	α	λ
Stainless steel	8.00	520	210,000	0.017	15
Copper	8.89	250–340	120,000	0.017	372
Galvanised steel	7.85	420	210,000	0.012	50
Brass	8.44	360	97,000	0.020	123
Gunmetal	8.74	220	84,000	0.018	72
Water	1.00	–	–	–	0.58
Plastic	0.92–1.55	–	350–3,500	0.08–0.20	0.15–0.40
Composite material	–	–	70,000	0.025–0.030	0.45

Tab. 70: Technical data for installation materials

Special applications

Low pressure steam systems

Steam systems use the physical properties of the two-phase system water/steam. The large amount of heat provided for water evaporation (evaporation enthalpy) is released during condensation in heat exchangers and thus allows large amounts of heat to be transported.
As such, the advantages of a steam system compared to a hot water heating system essentially lie in the fact that they operate at a higher energy level. In practice this means

- Higher temperatures
- Higher thermal performance
- Greater heat transfer in heat exchangers

These properties are used in particular for systems with a high heat transfer, e.g. district heat supply systems (in buildings) and industrial processes. The disadvantages lie in the significant technical requirements for the set-up and operation of steam systems.

- Greater technical and safety demands
- More extensive planning, mounting, operation and maintenance
- TÜV approvals

The components used in steam systems and their installation are subjected to enormous pressures and temperatures and therefore must be planned and executed with care.
The Steam Boiler Code makes a distinction between high- and low-pressure steam systems according to the pressure gradients in the installation systems. The pressure in low-pressure steam systems must not exceed 0.1 MPa. Max. temperature 120 °C.

Fig. 168: Heating system

Corrosion
To avoid corrosion in the steam generator and installsion, only treated feed-water should be used. The harmful ingress of oxygen in pipelines is prevent via effective ventilation.

Pipeline installation
Installations in steam systems must be designed so that the condensate which forms in the pipelines during cooling is effectively separated from the steam phase. Condensed water which is carried by the steam can reach high speeds (approx. 90 km/h) and cause damage from steam blasts in the installation or accelerate corrosion. The removal of condensate is aided by laying steam lines in the direction of flow at a gradient of approx. 0.5 to 1% and guiding them to the lowest points of the installation in separate conden-sate lines for removal of the latter. "Condensate loops" are included at the connection points between condensate drainers and steam lines, these fill with condensate and prevent steam from entering the condensate drainer [see Fig. 135]. The arrangement and planning of these condensate drainers is described in DIN EN 26704.

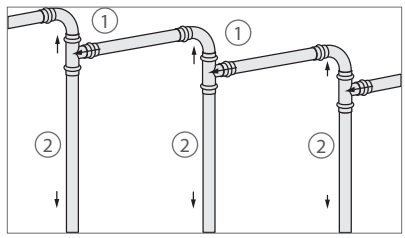


Fig. 169: Gradients in steam pipelines

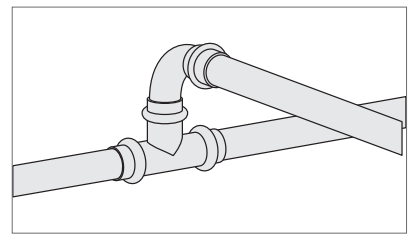


Fig. 170: Steam branch-off on the top of the pipe

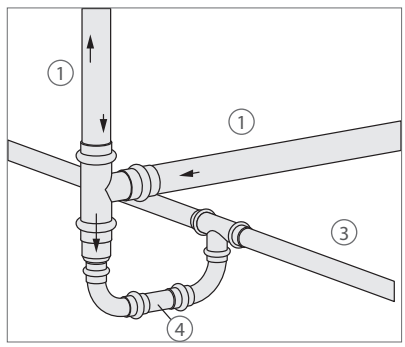


Fig. 171: Condensate loop – separation of steam and condensate

1 Steam/condensate
2 Steam drainage
3 Condensate pipeline
4 Condensate loop

Cooling and non-potable water systems

Cooling water systems

Water/glycol mixtures with a glycol content of up to 50% are mostly used for many industrial cooling processes. The Viega piping systems Megapress, Profipress, Sanpress Inox and Sanpress are particularly well suited for these applications.

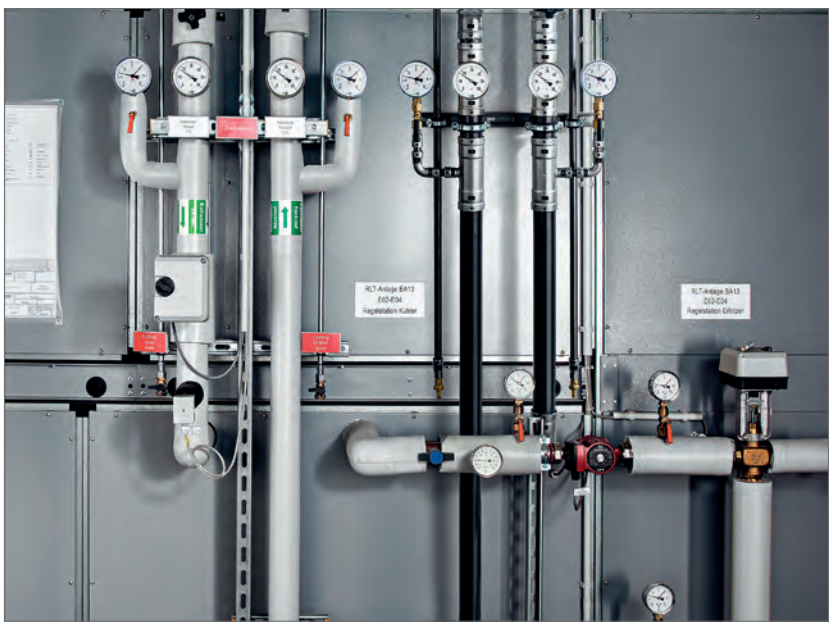


Fig. 172: Cooling water circuit for ventilation and air-conditioning technology system

Note:
Press connector systems are not suitable for transporting refrigerants.
Installations with Profipress or for drilling and cooling lubricants are to be agreed with the Viega Service Center on a case by case basis.

Process water systems

Processed water for chemical, medical and other processes is also referred to as "non-potable water" or "treated water". This is water which does not comply with the Potable Water Ordinance (TrinkwV). This non-potable water is essentially categorised into

- Partially or fully demineralised water
- Softened water
- Reprocessed water
- Osmosis water

Fig. 173: Treatment system for non-potable water

Notes for laboratories

Treated water is more chemically aggressive than potable water and therefore often contains metal ions from the piping systems.
Demineralised water is free from salts and their ions and thus has a lesser conductivity. Its considerable dissolving power renders it aggressive vis-à-vis pipe materials. The Sanpress Inox piping system and the associated press connectors are particularly well suited for demineralised and softened water – material components in barely detectable quantities are released into the water.

Systems free of paint-wetting impairment substances

System description

In German the abbreviation Labs stands for paint-wetting impairment substance. Products free of paint-wetting impairment substances are thus clean and not covered with substances which could lead to wetting problems when applying paint in the paint shop (silicones, oils, greases).
The demand for products free of paint-wetting impairment substances arose with the introduction of water-soluble paints in the automotive industry. Amongst other things, silicones in paint prevent the even distribution of the paint on the workpiece and result in the formation of visible dimples. Even the smallest of particles can render painted parts unsuitable for further use. Pipelines in paint shops, e.g. compressed air, technical gas and paint lines must be kept particularly clean.
With the Sanpress Inox and Prestabo products which are free of paint-wetting impairment substances, Viega has developed two complete press connector installation systems for the automobile industry.
Threaded and XL components as well as Easytop LF fittings are available for all systems to round off the product range.
Areas of application

- Manufacture and processing of water-soluble paints
- Manufacture of vehicle components with painted surfaces

Intended use

Valves and ball valves can be used in potable water installations without restrictions according to the DWO with
Operating temperatures ≤ 90 °C and
Operating pressures ≤ 1.0 MPa.
In heating systems in accordance with DIN EN 12828
Operating temperatures ≤ 105 °C and
Output ≤ 1 MW.
In compressed air systems with
Operating pressures ≤ 1.6 MPa.
The use for applications, other than those described above, must be approved by the Viega Service Center.

Manufacturing process

- Cleaning of the press connector after the production process (casting/deformation/machining)
- Mounting of special sealing elements using lubricants free of paint-wetting impairment substances
- Marked with a blue dot on the press connection
- Individual packaging with LF marking

Quality control
The production of press connectors free of paint-wetting impairment substances at Viega is subject to strict internal testing.
For quality assurance purposes, the so-called "crater records" of all well-known German car manufacturers who continually test Viega products are available.

Fig. 174: Marking of Sanpress Inox press connector, free from paint-wetting impairment substances

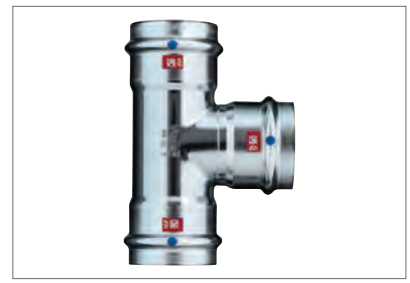


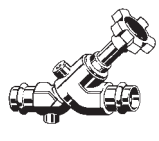
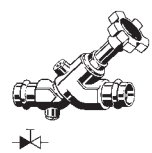
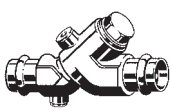
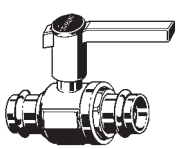
Fig. 175: Marking of Prestabo press connector, free from paint-wetting impairment substances

Fig. 176: Sanpress Inox packing unit, free from paint-wetting impairment substances

Fig. 177: Prestabo packing unit, free from paint-wetting impairment substances

Overview of fittings range

Easytop shut-off valves and ball valves
All the Easytop fittings listed in this section are DVGW-approved and feature Viega press connections. Just like the press connectors, fittings free of paint-wetting impairment substances are marked with a blue dot on the press connection.

	Model	Product name	Size d [mm]	Article number
	2237LF	Easytop slanted seat valve Free-flow valve	15 18 22 28 35 42 54	564 896 564 902 564 919 564 926 564 933 564 940 565 152
	2238LF	Easytop CRV slanted seat valve Free-flow valve with backflow preventer	15 18 22 28 35 42 54	565 169 565 176 565 183 565 206 565 213 565 220 565 237
	2239LF	Easytop backflow preventer	15 18 22 28 35 42 54	565 244 565 251 565 268 565 275 565 282 565 299 565 305
	2234LF	Easytop drainage valve	G¼	565 312
	2234.5LF	Easytop drainage valve extension	G x L ¼ x 50	565 329
	2270LF	Easytop ball valve	15 18 22 28 35 42 54	575 304 575 311 575 328 575 335 575 342 575 359 575 366

Tab. 71: Easytop shut-off valves and ball valves

Slanted seat valves
- Valve casing and top part made from gunmetal or silicon bronze DIN 50930-6
- Valve seat made of stainless steel with spindle transmission and position indication open/closed
- Handwheel with exchangeable media marking element green/red,
- With drain plug for Easytop slanted seat valve
- With drainage and testing connections for Easytop CRV slanted seat valve

Shipbuilding

Press connection requirements for shipbuilding

In accordance with DIN 86003-1 press connectors can be used for certain shipbuilding applications. The prerequisite for this is that the press connectors satisfy the requirements of the DVGW worksheet W 534 for potable water installations. Above and beyond this, the regulations and approvals of the respective classification societies must be observed.

System selection

When selecting the material, whether steel, stainless steel, copper, CuNiFe or plastic, the following criteria must be taken into account
- Suitability and approval [approvals see below] for the application areas, e.g. potable water, seawater, working air etc.
- Corrosion resistance to internal and external factors
- Resistance of the sealing elements vis-à-vis the transported medium in terms of chemical resistance, operating pressure and temperature
- Product information from the manufacturer

Drinking water

The potable water required on ocean vessels is stored in potable water tanks which are either located at harbours or the water is produced from seawater whilst at sea. The water quality must comply with the Potable Water Ordinance (TrinkwV) and must be sampled regularly; the results are to be documented in the ship's log.

Seapress / XL

Seapress connectors are made of the alloy CuNi10Fe 1.6Mn. This alloy fulfils the requirements for seawater applications in particular.

Technical data

[See “Seapress/XL” on page 26]

Areas of application
- Fire extinguishing and fire protection systems
- Sprinkler systems
- Seawater cooling

- Bilge and ballast systems
- Seawater desalination systems
- Operating pressure p_{max} = 1.6 MPa
- Operating temperatures 85 °C T_{max} = 110 °C

Fig. 178: Copper pipe installations with copper pipes and Easytop fittings

d x s [mm]	DN Nominal width	Volume per metre of pipe [litre/m]	Weight per metre of pipe [kg/m]
15 x 1.0	12	0.13	0.39
22 x 1.0	20	0.31	0.59
28 x 1.5	25	0.49	1.11
35 x 1.5	32	0.80	1.37
42 x 1.5	40	1.19	1.68
54 x 1.5	50	2.04	2.20
Seapress-XL pipes			
76.1 x 2.0	65	4.07	4.14
88.9 x 2.0	80	5.67	4.86
108.0 x 2.5	100	8.33	7.37

Tab. 72: Seapress pipes according to DIN 86019, EN 12449

Certification

Lloyd's Register

DNV GL

American Bureau of Shipping

Bureau Veritas

Registro Italiano Navale

Class NK

Medium	Pipes	Fittings	Comments
Saltwater	Galvanised steel	Grey cast iron	Limited service life with low flow rates
	Rubberised steel	Rubberised grey cast iron[3]	Medium service life with medium flow rates
	CuNi10Fe1.6Mn	Bronze, gunmetal[1] or rubberised grey cast iron	Long service life with high flow rates
		Titanium	Arrange corrosion protection for use in CuNiFe pipes
	Plastic	Plastic	Long service life, weight savings
Drinking water	steel	Bronze, steel, grey cast iron[2]	-
	CuNi10Fe1.6Mn	Bronze	Essentially underwater shipbuilding
Fuel	steel	Bronze, steel[2]	-
	CuNi10Fe1.6Mn	Bronze	Essentially underwater shipbuilding
Lubricating oil	steel	Bronze, steel[2]	-
	CuNi10Fe1.6Mn	Bronze	Essentially underwater shipbuilding
Hydraulic fluids	stainless steel	Steel, ductile cast iron	-
	stainless steel	stainless steel	Essentially underwater shipbuilding
Drinking water	Copper, stainless steel	Copper, copper alloys grey cast iron, ductile cast iron[2]	-
	stainless steel	stainless steel	Essentially underwater shipbuilding
	Plastic	Plastic	Long service life, weight savings
Spring and ballast water	stainless steel	stainless steel	-
	Galvanised steel	Bronze, steel, grey cast iron[1]	-
	CuNi10Fe1.6Mn	Bronze	Essentially underwater shipbuilding
	Plastic	Plastic[4]	Long service life, weight savings
Waste water sanitary and scupper	stainless steel	stainless steel	-
	Steel, galvanised steel	Steel, galvanised steel grey cast iron	-
	Plastic	Plastic	Long service life, weight savings
Boiler feed water	steel	Ductile cast iron[2]	-
Heat carrier oil	steel	Ductile cast iron	-
Distilled water	steel	steel	-
	Stainless steel, CuNi10Fe1.6Mn	Stainless steel, bronze	Essentially underwater shipbuilding
Condensate	steel	Grey cast iron[2]	-
	stainless steel	Stainless steel, bronze	Essentially underwater shipbuilding

Tab. 73: Materials and media in shipbuilding

[1] Inside parts made of bronze [2] Inside parts made of stainless steel [3] For cup neck fitting ductile cast iron with minimum elongation according to the specifications of the competent classification society [4] Consultation with classification society and client require

Regulations

Pipeline installations are to be planned taking the regulations for the respective ship type into account. Requirements from the following must be taken into account:

- Classification societies
- IMO
- Solas
- Marpol
- Respective country of registry, for instance the See-Berufsgenossenschaft
- Standards
- Equipment manufacturers
- Building regulations
- Pressure equipment directives
- UVV See
- US Coast Guard
- Regulations for the Suez Canal
- Regulations for the Panama Canal
- In Germany: DIN 86003 Part1

Pipelines

Prior to building the ship, the pipeline and instrumentation plans (PI plans) are to be drawn up containing all the important data on the piping systems used as well as the transported media, e.g. operating temperature/pressure. The PI plans must be submitted to the classification society for inspection. In the building regulations from the classification societies, the pipelines are allocated according to the type of medium and the thermodynamic operating state. This allocation determines which materials, moulded pieces, fittings and connecting elements may be used.

Fixing intervals

The distances for pipe fasteners given in the following table are specified for fixing pipelines.
Requirements for fixing intervals should restrict the number of fixing points to a technically justifiable amount, on the other hand, they should prevent intervals being so large as to cause damage due to vibrations.
The product information provided by the pipe manufacturer must also be taken into account along with these requirements.
General mounting rules

- Always arrange the fixing points: Before and after pipe elbows, branches and compensators
- Ensure that welded and screwed fixations between the pipe and ship construction are stressless.
- Select the fixing type to suit the pipe forces incurred and the ship movements
- The following are permitted: Pipe clamps or U-bolts for rigid or flexible fixings
- Fixing elements with springs can either be with or without diversions

The following must be taken into account when determining the fixing distances

- Pipe sizes and lengths
- Pipe materials (specific gravity, stability)
- Pipe connection type
- Transported medium (specific gravity)
- External/operating temperatures
- Operating pressures

DN	Max. fixing distance [mm]
≤ 10	800
12 – 25	1,200
32 – 100	2,200
125 – 200	3,000
250 – 350	4,000
400 – 500	5,000
≥ 500	6,000

Tab. 74: Recommended fixing distances

Exact calculation see DIN 86082.

Steel pipes		Copper pipes/ stainless steel pipes		PVC U-pipes			PE-HD pipes		
Nominal width	Fixing interval	Nominal width	Fixing interval	Nominal width d	Fixing distance 20 °C	40 °C	Nominal width d	Fixing distance 20 °C	40 °C
DN	m	d mm	m	mm	m	m	mm	m	m
10	2.25	12	1.25	–	–	–	–	–	–
–	-	15	1.25	16	0.80	0.50	16	0.70	0.60
15	2.75	18	1.50	20	0.90	0.60	20	0.75	0.65
20	3.00	22	2.00	25	0.65	0.65	25	0.80	0.75
25	3.50	28	2.25	32	1.05	0.70	32	0.90	0.85
32	3.75	35	2.75	40	1.20	0.90	40	1.00	0.95
40	4.25	42	3.00	50	1.40	1.10	50	1.15	1.05
50	4.75	54	3.50	63	1.50	1.20	63	1.30	1.20
–	–	64	4.00	–	–	–	–	–	–
65	5.50	76.1	4.25	75	1.65	1.35	75	1.40	1.30
80	6.00	88.9	4.75	90	1.80	1.50	90	1.55	1.45
100	6.00	108	5.00	110	2.00	1.70	110	1.70	1.60
–	–	–	–	–	–	–	–	1.85	1.70
125	6.00	133	5.00	140	2.25	1.95	140	1.95	1.80
150	6.00	159	5.00	160	2.40	2.10	160	2.05	1.90

Tab. 75: Fixing distances standard systems

Profipress		Prestabo		Megapress			Sanpress / Sanpress Inox		Raxofix / Sanfix Fosta	
d x s	Fixing distance	d x s	Fixing distance	D		Fixing interval	d x s	Fixing distance	d x s	Fixing interval
mm	m	mm	m	mm	inch		mm	m	mm	m
12 x 1.0	1.25	12x1.2	1.25			Comply with the instructions provided by the pipe manufacturer!	–	–	–	–
15 x 1.0	1.25	15x1.2	1.25				15x1.2	1.25	16x2.2	1.00
18 x 1.0	1.50	18x1.2	1.50	17.2	⅜		18x1.2	1.50	20x2.8	1.00
22 x 1.0	2.00	22x1.5	2.00	21.3	½		22x1.2	2.00	25x2.7	1.50
28 x 1.5	2.25	28x1.5	2.25	26.9	¾		28x1.2	2.25	32x3.2	1.50
35 x 1.5	2.75	35x1.5	2.75	33.7	1		35x1.5	2.75	40x3.5	1.75
42 x 1.5	3.00	42x1.5	3.00	42.4	1¼		42x1.5	3.00	50x4.0	2.00
54 x 2.0	3.50	54x1.5	3.50	48.3	1½		54x1.5	3.50	63x4.5	2.00
64.0 x 2.0	4.00	64.0x2.0	4.00	60.3	2		64.0x2.0	4.00		
76.1 x 2.0	4.25	76.1x2.0	4.25	76.1	2½		76.1x2.0	4.25		
88.9 x 2.0	4.75	88.9x2.0	4.75	88.9	3		88.9x2.0	4.75		
108.0 x 2.5	5.00	108x2.0	5.00	114.3	4		108x2.0	5.00		

Tab. 76: Fixing distances Viega press connector systems

	Profipress / Sanpress Inox	Profipress G / Sanpress Inox G	Megapress	Megapress G	
	Sealing element				Operating pressure
	EPDM	HNBR	EPDM	HNBR	p_{max} [MPa]
Compressed air	✓	✓	✓	✓	1.6
Carbon dioxide dry	–	✓	–	–	1.6
Nitrogen	✓	✓	✓	✓	1.6
Argon	✓	✓	–	✓	1.0
Corgon inert gas	✓	✓	–	–	1.6
Vacuum	✓	✓	✓	✓	-0.08
Oxygen	✓	–	–	–	1.0
Natural gas and liquid gas	–	✓	–	✓	0.5

Tab. 77: Press connector system/sealing element combination

Systems for technical gases

General

The generic term "technical gases" refers in general to gases which are used in large amounts for industrial applications. The Technical Rules for Compressed Gases (TRG) categorises gases and gas mixtures according to their properties. The piping systems Profipress, Profipress G, Sanpress Inox, Sanpress Inox G, Megapress and Megapress G can be used to transport a wide variety of these media.

The table below facilitates selection of the press connector system and the sealing element for special applications, taking account of the Viega press connector systems Profipress/Profipress G, Sanpress Inox/Sanpress Inox G and Megapress/Megapress G.

Laboratories as well as large technical areas are increasingly demanding gases and high and ultra-pure qualities. When the commercial qualities are no longer sufficient, ultra-pure gases are required where pollution is specified in ppm (parts-per-million). Ultra-pure gases can only be used in installations which, themselves, are absolutely clean and with components which do not react to the media. The Viega press connector system Sanpress Inox G has proven to be extremely effective for such installations.

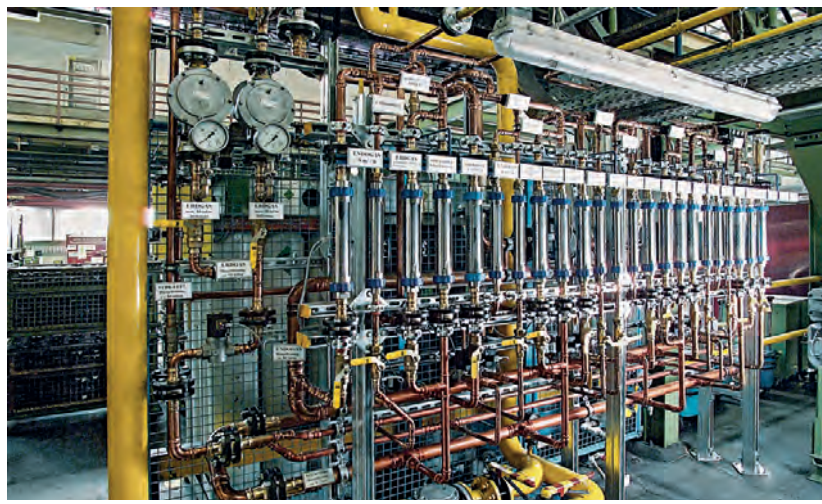


Fig. 179: Manifold bar for technical gases

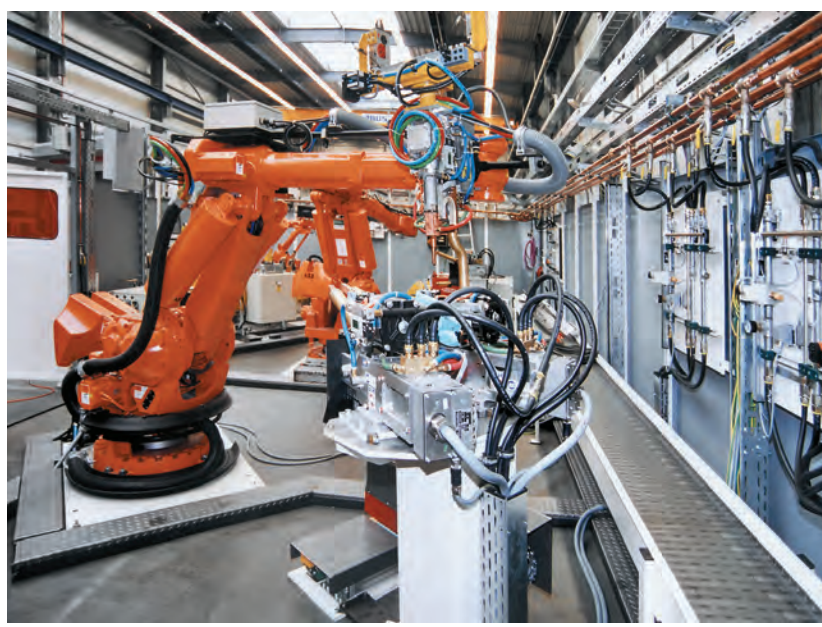


Fig. 180: Supply line for technical inert gases

Certificates for oxygen and acetylene
The use of "Sanpress Inox" and "Sanpress Inox free of paint-wetting impairment substances" in connection with stainless steel pipes 1.4521 and press connectors and moulded pieces made of stainless steel 1.4404 and 1.4401 is certified for the transportation of oxygen and acetylene.

Acetylene

Sizes	15–54 mm
Test pressure	2.4 MPa
Max. working pressure	0.15 MPa
Temperature range	-20 °C to +60 °C

Oxygen

Sizes	12–54 mm
Max. working pressure	1.0 MPa
Max. temperature	60 °C

according to: BAM certificate BAM/ZBF/011/10

Appendix

Media list

Fig. 181: Easytop ball valves for various media

Special media
For many years, Viega press connecting technology with the Sanpress, Sanpress Inox, Prestabo and Profipress systems has proved its worth for use in potable water and building services installations. Increasingly often, it is now used in industrial systems with special operating conditions in terms of pressure, temperature, and concentration of the transported media, requiring careful selection of the pipe and sealing materials.
The following tables allow selections to be made for most application areas. In special cases, please contact the Viega Service Center to discuss whether your application is in compliance with the "intended use" of a system. Please use the "Inquiry regarding material durability" form for fax inquiries.

Note:
Installation systems with press, clamp and plug connectors in fire extinguishing systems (dry and wet/dry) may be used if they have been approved for the specific area of application.

Sealing elements

Sealing element short name	Technical designation	Viega press connector system application	Colour
EPDM	Ethylene propylene diene rubber	Sanpress Inox/ Sanpress/Profipress/ Megapress	Polished black
HNBR	Acrylonitrile butadiene rubber	Sanpress Inox G/ Profipress G	Yellow
FKM	Fluor rubber	Sanpress Inox/ Sanpress/Profipress/ Megapress XL	Matt black

Tab. 78: Fixing distances Viega press connector systems

Pipes and press connectors – Water

Water		System name		Profi-press	Profi-press S	Sanpress Inox		Sanpress		Prestabo		Megapress		Sea-press
		Pipe material		Copper		Stainless steel				Gal-vani-sed steel	Hot dip galvani-sed steel	Thick-walled steel pipe		CuNiFe
						1.4521	1.4401	1.4521	1.4401					
		Connector material		Copper, gunmetal or silicon bronze		Stainless steel		Gunmetal or silicon bronze		Galvanised steel		Steel, zinc-nickel plated		CuNiFe
		Sealing element		EPDM	FKM	EPDM							FKM	EPDM
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]											
Treated water (non-potable water)	Fully desalinated, deionised, demineralised, distilled (open system)	1.6	110			✓	✓							
Cooling water, closed circuit	Open systems subject to agreement	1.6	≥ -25	✓	✓	✓	✓	✓	✓	✓ [3]	✓ [2, 3]	✓ [3]	✓ [3, 9]	✓
Vapour	Low pressure steam systems	≤ 0.1	120			✓ [1]	✓ [1]	✓ [1]	✓ [1]					✓ [1]
Well water	In accordance with DWO	1.6	110	✓		✓	✓	✓	✓					
Pump hot water heating systems	In accordance with DIN EN 12 828	1.6	105	✓	✓	✓	✓	✓	✓	✓		✓	✓ [9]	✓

Tab. 79: Water

[1] Replacement of sealing elements with FKM
[2] No additives
[3] Corrosion protection acc. to AGI Q 151
[9] For operating temperatures between -5 °C and +140 °C

Pipes and press connectors – Anti-freeze and corrosion protection, heat carriers

Anti-freeze / corrosion protection / cold and heat carriers		System name		Profi-press	Profi-press S	Sanpress Inox		Sanpress		Prestabo	Megapress		Seapress
		Pipe material		Copper		Stainless steel				Galvanised steel	Thick-walled steel pipe		CuNiFe
						1.4521	1.4401	1.4521	1.4401				
		Connector material		Copper, gunmetal or silicon bronze		Stainless steel		Gunmetal or silicon bronze		Galvanised steel	Steel, zinc-nickel plated		CuNiFe
		Sealing element		EPDM	FKM	EPDM						FKM	EPDM
Medium	**Product/manufacturer**	**p_{max} [MPa]**	**T_{max} [°C]**										
Anti-freeze, cooling brines concentration of 50%	Antifrogen N / Clariant	1.6	-25 to 110	✓	✓	✓	✓	✓	✓	✓ [3]	✓ [3]	✓ [3, 9]	✓
	Antifrogen L / Clariant			✓	✓	✓	✓	✓	✓	✓ [3]	✓ [3]	✓ [3, 9]	✓
	Antifrogen Sol (solar installati-ons) / Clariant			✓	✓	✓	✓	✓	✓	✓ [3]	✓ [3]	✓ [3, 9]	✓
	Ethylene glycol (ethane-1.2-diol)			✓	✓	✓	✓	✓	✓	✓ [3]	✓ [3]	✓ [3, 9]	✓
	Propylene glycol (1.2-Propandiol)			✓	✓	✓	✓	✓	✓	✓ [3]	✓ [3]	✓ [3, 9]	✓
	Tyfoxit / Tyforop-Chemie			✓	✓	✓	✓	✓	✓	✓ [3]	✓ [3]	✓ [3, 9]	✓
	Tyfocor / Tyforop-Chemie			✓	✓	✓	✓	✓	✓	✓ [3]	✓ [3]	✓ [3, 9]	✓

Tab. 80: Anti-freeze and corrosion protection, heat carriers

[3] Corrosion protection acc. to AGI Q 151

[9] For operating temperatures between -5 °C and +140 °C

Pipes and press connectors - Oils

Oils		System name		Profipress	Sanpress Inox		Sanpress		Profi-press G	Sanpress Inox G	Megapress G
		Pipe material		Copper	Stainless steel 1.4521	Stainless steel 1.4401	Stainless steel 1.4521	Stainless steel 1.4401	Copper	Stainless steel	Thick-walled steel pipe
		Connector material		Copper, gunmetal or silicon bronze	Stainless steel		Gunmetal or silicon bronze		Copper, gunmetal or silicon bronze	Stainless steel	Steel, zinc-nickel plated
		Sealing element		EPDM	EPDM				HNBR		
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]								
Mineral oils SAE	15 – 108.0 mm	1.6	70							✓ [4]	✓
Fuel oil acc. to DIN 51603-1 Diesel acc. to DIN EN 590	According to TRbF (German Technical Regulations for Flammable Liquids) 15 – 54 mm	0.5	40						✓	✓	✓
Palm oil		1.0	70							✓ [4]	✓ [10]
Rapeseed oil	DIN W51805									✓ [4]	✓ [10]
Soy oil										✓ [4]	✓ [10]
Sunflower oil										✓ [4]	✓ [10]
Biodiesel	EN 14214				✓ [1]	✓ [1]					
Palm oil heating			90		✓ [1]	✓ [1]					

Tab. 81: Oils

[1] Replacement of sealing elements for FKM
[4] In combination with Sanpress pipe 1.4521 and 1.4401
[10] After consultation with the headquarters in Attendorn

Pipes and press connectors – Gases

Gases		System name		Profipress	Profipress S	Sanpress Inox		Sanpress		Profi-press G	San-press Inox G	Prestabo		Mega-press		Seap-ress
		Pipe material		Copper	Copper	Stainless steel				Copper	Stainless steel	Galva-nised steel	Hot dip galva-nised steel	Thick-walled steel pipe		CuNiFe
						1.4521	1.4401	1.4521	1.4401							
		Connector material		Copper, gunmetal or silicon bronze	Copper, gunmetal or silicon bronze	Stainless steel		Gunmetal or silicon bronze		Copper, gunmetal or silicon bronze	Stainless steel	Galva-nised steel	Galva-nised steel	Steel, zinc-nickel plated		CuNiFe
Purity requirements acc. to DIN EN 437 on request		Sealing element		EPDM	FKM	EPDM				HNBR	HNBR	EPDM			FKM	EPDM
Medium	Comment	p_{max} [MPa]	T_{max} [°C]													
Compressed air	Oil concentration ≤ 25 mg/m³ 12 – 108 mm	1.6		✓	✓	✓	✓	✓	✓	✓	✓	✓ [6]	✓	✓ [6]	✓ [6]	✓
	Oil concentration ≥ 25 mg/m³ 12 – 108 mm				✓					✓	✓ [6]	✓ [1, 6]	✓ [1]		✓ [6]	✓ [1]
Natural gas	According to G260	0.5								✓ [5]	✓					
Liquid gases, propane, butane, methane	According to G260									✓ [5]	✓ [6]					
Acetylene	Test pressure 2.4 MPa 15 – 54 mm	0.15	60			✓ [7]										
Argon	12 – 54 mm	1.6		✓		✓	✓	✓	✓	✓	✓				✓	
	64 – 108 mm	1.0														
Carbogen	$CO_2 + O_2$ 12 – 54 mm	1.6		✓		✓	✓	✓	✓	✓	✓				✓	
	64 – 108 mm	1.0														
Oxygen O_2	Keep free of oil and grease 12 – 54 mm	1.0		✓		✓ [7]										

Tab. 82: Pipes and press connectors – Gases 1/3

[1] Replacement of sealing elements for FKM
[5] In case of HTR (higher thermal resistance) requirement, max. permitted operating pressure p_{max} = 0.1 MPa
[6] Almost condensate-free
[7] BAM-certified

Pipes and press connectors – Gases

Gases		System name		Profipress	Profipress S	Sanpress Inox		Sanpress		Profipress G	San-press Inox G	Prestabo		Mega-press		Seap-ress
		Pipe material		Copper	Copper	Stainless steel				Copper	Stainless steel	Galva-nised steel	Hot dip galva-nised steel	Thick-walled steel pipe		CuNiFe
						1.4521	1.4401	1.4521	1.4401							
		Connector material		Copper, gunmetal or silicon bronze	Copper, gunmetal or silicon bronze	Stainless steel		Gunmetal or silicon bronze		Copper, gunmetal or silicon bronze	Stainless steel	Galva-nised steel	Galvani-sed steel	Steel, zinc-nickel plated		CuNiFe
Purity requirements acc. to DIN EN 437 on request		Sealing element		EPDM	FKM	EPDM				HNBR	HNBR	EPDM			FKM	EPDM
Medium	Comment	p_{max} [MPa]	T_{max} [°C]													
Nitrogen N_2	Downstream of the vaporiser 12 – 54 mm	1.6	60	✓		✓	✓	✓	✓	✓	✓			✓	✓	
	64 – 108 mm	1.0														
Hydrogen H_2	12 – 108 mm	0.5		✓		✓	✓	✓	✓	✓	✓					
Carbon dioxide CO_2	dry 12 – 54 mm	1.6		✓		✓	✓	✓	✓	✓	✓					
	64 – 108 mm	1.0														
Carbon monoxide CO	Stainless steel parts not permitted 12 – 54 mm	1.6		✓						✓						
	64 – 108 mm	1.0														
Coarse vacuum	P_{abs} = 200 hPa			✓		✓	✓	✓	✓	✓	✓			✓		✓
Forming gas, dry	Ar + CO_2 (e.g. corgon)15 – 54 mm	1.6		✓		✓	✓	✓	✓	✓	✓			✓	✓	
	64 – 108 mm	1.0														
Nitrous oxide (laughing gas)	12–54 mm	1.6				✓	✓									
	64–108 mm	1.0														

Tab. 83: Pipes and press connectors – Gases 2/3

Pipes and press connectors – Gases

Gases		System name	Profi-press	Profi-press S	Sanpress Inox		Sanpress		Profi-press G	San-press Inox G	Prestabo		Mega-press		Seapress
		Pipe material	Copper	Copper	Stainless steel				Copper	Stainless steel	Galva-nised steel	Hot dip galva-nised steel	Thick-walled steel pipe		CuNiFe
					1.4521	1.4401	1.4521	1.4401							
		Connector material	Copper, gunme-tal or silicon bronze	Copper, gunme-tal or silicon bronze	Stainless steel		Gunmetal or silicon bronze		Copper, gunme-tal or silicon bronze	Stainless steel	Galvani-sed steel	Galvani-sed steel	Steel, zinc-nickel plated		CuNiFe
Purity requirements acc. to DIN EN 437 on request		Sealing ele-ment	EPDM	FKM	EPDM				HNBR	HNBR	EPDM			FKM	EPDM
Medium	Comment	p_{max} [MPa]	T_{max} [°C]												
Ethane	12–54 mm	1.6	60							✓					
	64–108 mm	1.0													
Ethene (ethylene)	12–54 mm	1.6								✓					
	64–108 mm	1.0													
Helium	12–54 mm	1.6							✓	✓					
	64–108 mm	1.0													
Krypton	15–54 mm	1.6	✓		✓	✓	✓	✓	✓	✓					
	64–108 mm	1.0													
Neon	15–54 mm	1.6	✓		✓	✓	✓	✓	✓	✓					
	64–108 mm	1.0													
Propene (propylene)	15–54 mm	1.6				✓ [1]									
	64–108 mm	1.0													
Xenon	15–54 mm	1.6	✓		✓	✓	✓	✓	✓	✓					
	64–108 mm	1.0													
Synthetic air	12–54 mm	1.6	✓	✓	✓	✓	✓	✓	✓	✓					✓
	64–108 mm	1.0													

Tab. 84: Pipes and press connectors – Gases 3/3

[1] Replacement of sealing elements for FKM

Pipes and press connectors – Special media

Special media		System name	Profipress	Sanpress Inox		Sanpress		Profipress G	Sanpress Inox G	Prestabo	Seapress
		Pipe material	Copper	Stainless steel 1.4521	Stainless steel 1.4401	Stainless steel 1.4521	Stainless steel 1.4401	Copper	Stainless steel 1.4401	Galvanised steel	CuNiFe
		Press connector material	Copper, gunmetal or silicon bronze	Stainless steel		Gunmetal or silicon bronze		Copper, gunmetal or silicon bronze	Stainless steel	Galvanised steel	CuNiFe
Purity requirements acc. to DIN EN 437 on request		Sealing element	EPDM	EPDM		EPDM		HNBR	HNBR	EPDM	EPDM
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]								
Urea solution	Max. concentration 40 %	1.0	40		✓	✓					
Ethanol		1.6	25	✓	✓	✓	✓				
Methanol	Caution: toxic!	1.6	25		✓	✓					
Condensate	From gas-powered calorific value devices, not from oil-powered calorific value devices!	1.6	110		✓	✓					
Condensate	of vapour	1.6	110	✓[8]	✓	✓	✓[8]	✓[8]				✓
Glyceryl triacetate		0.1	20		✓	✓					
Caustic soda	30 % aqueous solution	1.0	20		✓	✓					
Acetone	liquid	0.5	-10 to 40	✓	✓	✓	✓	✓			
Ammoniac	Medium free from CO_2 + H_2O Caution: toxic!	0.2	25		✓	✓					
Biogas – upstream of washer	45 – 70 % CH_4 / 20 – 45 % CO_2 H_2S < 30 mg/m³	0.5	70						✓		
Biogas – downstream of washer	According to G260 and G262	0.5	70					✓[5]	✓		
Fermenter heating	Substrate temperature 65 °C	1.0	105			✓					

Tab. 85: Special media

[5] In case of HTR (higher thermal resistance) requirement, max. permitted operating pressure p_{max} = 0.1 MPa

[8] Without pre-cleaning

Fittings – Water

Water		Product name		Easytop ball valve	Easytop ball valve	Free-flow valve	Easytop Inox ball valve	Profipress G gas ball valve	Gas ball valve
		Model no.		2270 2270.4 2270.10 2275 2275.3 2275.4	2270.1 2270.2 2275.2 2275.5 2275.6 2275.1	2242 2278	2370	2670 2670.4 2671 2671.3	G2101
		Press connector material		Gunmetal or silicon bronze			Stainless steel	Gunmetal or silicon bronze	Brass
		Seal		EPDM		EPDM	EPDM	HNBR	
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]						
Drinking water	In accordance with DWO DIN 50 930-6	1.6	110	✓	✓	✓	✓		
Treated water (non-potable water)	Fully desalinated, deionised, demineralised, distilled (open system)	1.6	110				✓		
Cooling water, closed circuit	Open systems available on request	1.6	≥-25	✓	✓	✓	✓		
Well water	In accordance with DWO	1.6	110	✓	✓	✓	✓		
Pump hot water heating systems	In accordance with DIN EN 12828	1.6	105	✓	✓	✓	✓		

Tab. 86: Water

Fittings – Anti-freeze and corrosion protection, heat carriers

Anti-freeze / corrosion protection / cold and heat carriers		Product name		Easytop ball valve	Easytop ball valve	Free-flow valve	Easytop Inox ball valve	Profipress G gas ball valve	Gas ball valve
		Model no.		2270 2270.4 2270.10 2275 2275.3 2275.4	2270.1 2270.2 2275.2 2275.5 2275.6 2275.1	2242 2278	2370	2670 2670.4 2671 2671.3	G2101
		Press connector material		Gunmetal or silicon bronze			Stainless steel	Gunmetal or silicon bronze	Brass
		Seal		EPDM		EPDM	EPDM	HNBR	
Medium	**Product/manufacturer**	**p_{max} [MPa]**	**T_{max} [°C]**						
Anti-freeze, cooling brines Concentration 50 %	Antifrogen N / Clariant	1.6	-25 to 110	✓	✓	✓	✓		
	Antifrogen L/Clariant			✓	✓	✓	✓		
	Antifrogen Sol (solar installations)/Clariant			✓	✓	✓	✓		
	Ethylene glycol (Ethan-1.2-diol)			✓	✓	✓	✓		
	Propylene glycol (1.2-Propandiol)			✓	✓	✓	✓		
	Tyfoxit / Tyforop-Chemie			✓	✓	✓	✓		
	Tyfocor / Tyforop-Chemie			✓	✓	✓	✓		

Tab. 87: Anti-freeze and corrosion protection, heat carriers

Fittings – Oils

Oils		Product name		Easytop ball valve	Easytop ball valve	Free-flow valve	Easytop Inox ball valve	Profipress G gas ball valve	Gas ball valve
		Model no.		2270 2270.4 2270.10 2275 2275.3 2275.4	2270.1 2270.2 2275.2 2275.5 2275.6 2275.1	2242 2278	2370	2670 2670.4 2671 2671.3	G2101
		Press connector material		Gunmetal or silicon bronze			Stainless steel	Gunmetal or silicon bronze	Brass
		Seal		EPDM		EPDM	EPDM	HNBR	
Medium	**Product/manufacturer**	**p_{max} [MPa]**	**T_{max} [°C]**						
Mineral oils SAE		1.6						✓	✓
Palm oil		1.0	70					✓	✓
Rapeseed oil	DIN W51805							✓	✓
Soy oil								✓	✓
Sunflower oil								✓	✓
Palm oil heating	Fittings not in palm oil		90	✓	✓	✓	✓		

Tab. 88: Oils

Fittings – Gases

Gases Purity requirements acc. to DIN EN 437 on request		Product name		Easytop ball valve	Easytop ball valve	Free-flow valve	Easytop Inox ball valve	Profipress G gas ball valve	Gas ball valve
		Model no.		2270 2270.4 2270.10 2275 2275.3 2275.4	2270.1 2270.2 2275.2 2275.5 2275.6 2275.1	2242 2278	2370	2670 2671	G2101
		Press connector material		Gunmetal or silicon bronze			Stainless steel	Gunmetal or silicon bronze	Brass
		Seal		EPDM		EPDM	EPDM	HNBR	
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]						
Compressed air	Oil concentration ≤ 25 mg/m³ 12–108 mm	1.6	60	✓	✓		✓	✓	✓
	Oil concentration ≥ 25 mg/m³ 12–108 mm							✓	✓
Natural gas	According to G260	0.5						✓ [5]	✓ [5]
Liquid gases, propane, butane, methane	According to G260	0.5						✓ [5]	✓ [5]
Argon	12–54 mm	1.6		✓	✓		✓	✓	✓
	64–108 mm	1.0							
Carbogen	$CO_2 + O_2$ 12–54 mm	1.6		✓	✓		✓	✓	✓
	64–108 mm	1.0							
Nitrogen N_2	Downstream of the vaporiser 12–54 mm	1.6		✓	✓		✓	✓	✓
	64–108 mm	1.0							

Tab. 89: Fittings Gases 1/3

[5] In case of HTR (higher thermal resistance) requirement, max. permitted operating pressure p_{max} = 0.1 MPa

Gases Purity requirements acc. to DIN EN 437 on request		Product name		Easytop ball valve	Easytop ball valve	Free-flow valve	Easytop Inox ball valve	Profipress G gas ball valve	Gas ball valve
		Model no.		2270 2270.4 2270.10 2275 2275.3 2275.4	2270.1 2270.2 2275.2 2275.5 2275.6 2275.1	2242 2278	2370	2670 2671	G2101
		Press connector material		Gunmetal or silicon bronze			Stainless steel	Gunmetal or silicon bronze	Brass
		Seal		EPDM		EPDM	EPDM	HNBR	
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]						
Hydrogen H_2	12 – 108 mm	0.5		✓	✓		✓	✓	✓
Carbon dioxide CO_2	dry 12 – 54 mm	1.6		✓	✓		✓	✓	✓
	64 – 108 mm	1.0							
Carbon monoxide CO	Stainless steel parts not permitted 12 – 54 mm	1.6		✓	✓			✓	✓
	64 – 108 mm	1.0							
Coarse vacuum	P_{abs} = 200 hPa			✓			✓	✓	✓
Forming gas, dry/ inert gas	Ar + CO_2 (e.g. corgon) 12–54 mm	1.6		✓	✓		✓	✓	✓
	64–108 mm	1.0							
Dinitrogen monoxide (laughing gas)	12–54 mm	1.6			✓		✓		
	64–108 mm	1.0							
Ethane	12–54 mm	1.6						✓	✓
	64–108 mm	1.0							
Ethene (ethylene)	12–54 mm	1.6						✓	✓
	64–108 mm	1.0							

Tab. 90: Fittings Gases 2/3

Fittings – Gases

Gases Purity requirements acc. to DIN EN 437 on request		Product name		Easytop ball valve	Easytop ball valve	Free-flow valve	Easytop Inox ball valve	Profipress G gas ball valve	Gas ball valve
		Model no.		2270 2270.4 2270.10 2275 2275.3 2275.4	2270.1 2270.2 2275.2 2275.5 2275.6 2275.1	2242 2278	2370	2670 2671	G2101
		Press connector material		Gunmetal or silicon bronze			Stainless steel	Gunmetal or silicon bronze	Brass
		Seal		EPDM		EPDM	EPDM	HNBR	
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]						
Helium	12–54 mm	1.6	60					✓	✓
	64–108 mm	1.0							
Krypton	15–54 mm	1.6		✓	✓		✓		
	64–108 mm	1.0							
Neon	15–54 mm	1.6		✓	✓		✓		
	64–108 mm	1.0							
Xenon	15–54 mm	1.6		✓	✓		✓		
	64–108 mm	1.0							
Synthetic air	12–54 mm	1.6		✓	✓		✓	✓	✓
	64–108 mm	1.0							

Tab. 91: Fittings Gases 3/3

Fittings – Special media

Special media		Product name	Easytop ball valve	Easytop ball valve	Free-flow valve	Easytop Inox ball valve	Profipress G gas ball valve	Gas ball valve
		Model no.	2270 2270.4 2270.10 2275 2275.3 2275.4	2270.1 2270.2 2275.2 2275.5 2275.6 2275.1	2242 2278	2370	2670 2671	G2101
		Press connector material	Gunmetal or silicon bronze			Stainless steel	Gunmetal or silicon bronze	Brass
Purity requirements acc. to DIN EN 437 on request		Seal	EPDM		EPDM	EPDM	HNBR	
Medium	**Comment**	p_{max} [MPa]	T_{max} [°C]					
Urea solution	Max. concentration 40 %	1.0	40				✓		
Ethanol		1.6	25	✓	✓	✓	✓		
Methanol	Toxic!	1.6	25				✓		
Condensate	From gas-powered calorific value devices, not from oil-powered calorific value devices!	1.6	110				✓		
Condensate	of vapour	1.6	110	✓[8]	✓[8]	✓[8]	✓		
Caustic soda	30 % aqueous solution	1.0	60				✓		
Acetone	liquid	0.5	-10–40	✓	✓	✓	✓		
Biogas downstream of washer	According to G260 and G262	0.5	70					✓[5]	✓[5]
Fermenter heating	Substrate temperature 65 °C outside of the fermenter	1.0	105	✓	✓		✓		
Fermenter heating	Substrate temperature 65 °C outside of the fermenter	1.0	105	✓	✓		✓		

Tab. 92: Special media

[5] In case of HTR (higher thermal resistance) requirement, max. permitted operating pressure p_{max} = 0.1 MPa

[8] Without precleaning

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