**Table of Contents: Tendering Text Aliaxis Deutschland GmbH  
FRIALEN®-Safety Fittings**

**1.0 Electrofusion couplers**

1.1 Couplers with and without removable stop **MB /UB**

1.2 Couplers without removable stop **UB PN25**

1.3 Couplers without removable stop **UB SDR 9**

1.4 Conical ring couplers **KM**

1.5 Long couplers **FRIALONG**

1.6 Long couplers with integrated excess flow valve Sentry GS® **FRIASTOP** **M** (System Maxitrol)

1.7 Long couplers with integrated excess flow valveGas-Stop® **FRIASTOP** **P** (System Pipelife)

1.8 Reducer MR with integrated excess flow valve Sentry GS® **MR STOP** (System Maxitrol)

**2.0** **End caps** **MV**

**3.0** **Reducers** **MR**

**4.0** **Elbows W**

4.11 Elbows 45° and elbows 90°

4.12 Elbows 30°

**5.0 I/A Elbows 11° WS11°**

**6.0 Swan neck bend WET**

**7.0 T Pieces 90° T**

**8.0 Pipe joint section Y/YS**

**9.0 Transition fittings** HD-PE/steel for gas pipes **USTR/USTN/USTM/WUSTN 90°/WUSTM 90°**

9.11 With fusion end for steel pipes **USTR**

9.2 Transition fittings HD-PE/steel **USTRS** spigot fittings

**10.0 Transition fittings** HD-PE/brass, V2A, gunmetalfor gas- and water pipes **MUN/MUM/WUN 45°/**

**WUN 90°/UAN/UAM**

10.1 with integrated heating coils

10.2 with pipe spigot

10.3 Transition fitting for liquid gas HDPE/copper **UFLG**

**11.0 Pressure tapping tees**

11.1 Pressure tapping tees with fast clamping lever and with integrated drill **DAA**

11.2 Pressure tapping tees Top-Loading **DAA TL**

11.3 Pressure tapping tees with parallel dome **DAP**

11.4 Cap for Pressure tapping tees **DK**

**12.0 Pressure tapping valves**

12.1 Pressure tapping valves with integrated drill **DAV**

12.2 Pressure tapping valves Top-Loading **DAV TL**

12.3 Pressure tapping valves with integrated drill **DAV / DAV ACW** with fast clamping lever **RED SNAP**

12.4 Installation kits for pressure tapping valves **DBS**

**13.0 Shut-off saddles**

13.1 Shut-off saddles **SPA**

13.2 Shut-off saddles Top-Loading **SPA TL**

13.3 Cap for Shut-off saddles **SPAK**

**14.0 Spigot saddles**

14.1 Spigot saddles **SA**

14.2 Spigot saddles Top-Loading **SA TL**

14.3 Spigot saddles with flange outlet **SA FL**

14.4 Spigot saddles Vacuum-Loading with large outlet spigot **SA VL**

14.5 Spigot saddles Universal **SA UNI**

**15.0 PE shut-off valve**

15.1 **FRIALOC®**-PE shut-off valve for water service pipes

15.2 Installation kits for FRIALOC®-PE shut-off valves **FBS**

**16.0 Ball valves**

16.1 Ball valves in HD-PE, ¼ turn **KHP**

16.2 Ball valves in HD-PE, ¼ turn, clearway **KH**

16.3 Ball valves in HD-PE, ¼ turn, clearway **KHW**

16.4 Tapping ball valves in HD-PE, ¼ turn, for side tapping under pressure **AKHP**

16.5 Tapping ball valves in HD-PE, ¼ turn, Top-Loading for side tapping under pressure **AKHP TL**

16.6 Installation kits for ball valves and tapping ball valves (Standard and Top-Loading) **KBS**

**17.0 Flange T** **Pieces** for the direct connection of hydrant or valves

17.1 Flange T Piece **TFL**

17.2 Elbows 90° with base unit **WF 90°**

17.3 Flange reducer **FLR**

**18.0 Full faced flanges** (Spigot fittings) **EFL**

**19.0 Repair and Reinforcing Saddles**

19.1 Reinforcing Saddle **RS**

19.2 Repair and Reinforcing Saddle **RSV**

19.3 Repair Saddle Vacuum-Loading **RS VL**

19.4 Repair Saddle Top-Loading **RS TL**

**20.0** **FRIATOP** clamping device

**21.0** **VACUSET** clamping unit

**22.0** **UNITOP** clamping device

**23.0** **FRIALOAD** clamping device

**24.0** **FWAB / FWAB ASA** drilling device

**25.0** **FWDPA SA** pressure sample adapter

**26.0** **FIXBLOC**

26.1 **FIXBLOC FWFB** clamping device

**27.0** Purge stack 1“ / 2“ **GAB 1 / GAB 2**

**Tendering Texts for the FRIALEN®-System**

**FRIALEN®- safety fittings in HD-PE (PE 100) for the connection of water, gas and industrial pipes with or without pressure made of HD-PE (PE 80, PE 100, PE 100RC and PE‑Xa) for operating pressures up to 25 bar (water) and 10 bar (gas).**

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 1.0    1.1 |  | **Electrofusion couplers for longitudinally strong connections of HD-PE pipes**  **MB/UB Couplers with or without removable stop**  **Features:**   * dimensions PE 100/ SDR 11 / SDR 17 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * both sides of the pipe can be fused simultaneously up to d 355 * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * MB couplers with easily removable central stop up to d 160 * insertion depth in line with ISO maximum requirements * extra wide fusion zones (minimum 1/3 up to d 225) * extra-long cold zones at the ends and in the middle to improve pipe guidance and prevent flow of molten material * from d 400 with pre-heating technology for optimum gap bridging (d 400 – d 450 optional; d 500 – d 1200 prescribed) * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request   DVGW registration to GW335 – B2 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
|  |  | **Available in the sizes:**   * **PE 100 / SDR 11**  |  |  |  |  | | --- | --- | --- | --- | | d 16  d 20 | d 110  d 125 | d 315  d 355 | d 900  d 10001 | | d 25 | d 140 | d 400 |  | | d 32 | d 160 | d 450 |  | | d 40 | d 180 | d 500 |  | | d 50 | d 200 | d 560 |  | | d 63 | d 225 | d 630 |  | | d 75 | d 250 | d 710 |  | | d 90 | d 280 | d 800 |  | |  |  |  |  |  * **PE 100 / SDR 17**   d 315  d 355  d 400  d 450  d 500  d 560  d 630  d 710  d 800  d 900  d 10001  d 12001  1 Use FRIAMAT-XL electrofusion unit (high-voltage current), FWSG-XL scraper tool |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 1.2 |  | **Couplers without removable stop** **UB PN25  for a maximum operating pressure of 25 bar (water)**  **Features:**   * dimensions PE 100/ SDR 7,4 * both sides of the pipe can be fused simultaneously up to d 250 * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * insertion depth in line with ISO maximum requirements * extra wide fusion zones (minimum 1/3 up to d 225) * extra-long cold zones at the ends and in the middle to improve pipe guidance and prevent flow of molten material * from d 280 with pre-heating technology for optimum gap bridging (d 280 – d 355) * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out. * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Available in the sizes:**   |  |  |  | | --- | --- | --- | | d 90 | d 3151 |  | | d 110 | d 3551 |  | | d 125 |  |  | | d 140 |  |  | | d 160 |  |  | | d 180 |  |  | | d 200 |  |  | | d 225 |  |  | | d 250  d 2801 |  |  |   **1** separate fusion zones |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 1.3 |  | **Couplers without removable stop** **UB SDR 9  for a maximum operating pressure of 20 bar (water)**  **Features:**   * dimensions PE 100/ SDR 9 * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * insertion depth in line with ISO maximum requirements * extra wide fusion zones * extra-long cold zones at the ends and in the middle to improve pipe guidance and prevent flow of molten material * from d 400 with pre-heating technology for optimum gap bridging (d 400 – d 450 optional, d 500 – d 630 required) * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out. * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Available in the sizes:**  d 4001  d 4501  d 5001  d 5601  d 6301  **1** separate fusion zones |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 1.4 |  | **Conical ring coupler KM**  **Electrofusion-Coupler for minimisation of the joint gap thanks to flex ring system and with integrated assembling aid.  For maximum operating pressure of 10 bar (water)/5 bar (gas)**  **Features:**   * dimensions PE 100/ SDR 17 * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * variable diameter range to bridge large tolerance conditions of the outer pipe diameter and out-of-roundness * with flexible fusion conical ring for easy assembly given pronounced pipe out-of-roundness * mechanical minimisation of the joint gap thanks to flex ring system * integrated tensioning device for assembly and gap minimisation * exposed, fixed heating coil, for optimal heat transfer during fusion, broad fusion zones as well as melt flow-inhibiting cold zones at the fronts and the centre for improved pipe guidance and prevention of melt release * individually packed in a box and covered with a plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Available in the sizes:**  d 355  d 400  d 450  d 560  d 630  d 800  d 1000  d 1200 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 1.5 |  | **Long couplers: FRIALONG**  **with pipe alignment function due to extra-long design especially designed for fusion of coiled pipes low in tension.**  **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * both sides of the pipe can be fused simultaneously * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * couplers with easily removable centre stop * **extra-large** insertion depth to provide firm guidance of pipes * **extra-long** fusion zones * **extra-long** cold zones at the ends and in the middle to prevent the flow of molten material * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 607, GW335 – B2   **Available in the sizes:**  d 32  d 40  d 50  d 63 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 1.6 |  | **FRIALONG long coupler with integrated excess flow valve (Sentry GS**®**):**  **FRIASTOP M, System Maxitrol (Gas)**  **Features:**   * electrofusion couplers in FRIALONG long design with integrated safety device which automatically shuts off gas flow in the event of pipe damage, caused e.g. by digger or drilling work. Technical information and nominal values according to manufacturers’ indications, see also FRIALEN data sheet No. 49 * compact component, connection of FRIALONG long coupler and excess flow valve fitted and checked by factory.   FRIALONG electrofusion coupler   * exposed heating coils for ideal heat transfer * extra-long insertion depth for firm guidance of pipes * extra-long fusion zones * extra-long cold zones at ends and in the centre to prevent flow of molten material   Additional features:   * dimensions PE 100/SDR 11 * **H2 ready 20.** Our products are suitable for use with 20% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * both sides of the pipe can be fused simultaneously * exposed, firmly embedded heating coils, without PE coating, for the ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * individually packed in plastic bag including tips for installation, identification card giving characteristic product data including fixing options * temperature compensation (fusion time is automatically adjusted to ambient temperature) * clear marking of prescribed direction of installation * data plate indicating type to DVGW-VP305-2 * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting as well as the gas stop valve * all information regarding connection details can be recorded. * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration FRIALONG to VP 607, GW335 - B2 * DVGW-registration gas flow monitor to VP305-2 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
|  |  | **Available in 3 designs:**  **Type D:** for power pressure 25 mbar – 1 bar, with bypass opening  **Type B:** for power pressure 100 mbar – 5 bar, without bypass opening  **Type Z:** for power pressure 35 mbar – 5 bar, with bypass opening  **Available in the sizes:**  d 32  d 40  d 50  d 63 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 1.7 |  | **FRIALONG** **long coupler with integrated gas stop®:**  **FRIASTOP P,** **System Pipelife (Gas)**  **Features:**   * Electrofusion couplers in FRIALONG long design with integrated safety device which automatically shuts off gas flow in the event of pipe damage, caused e.g. by digger or drilling work. Technical information and nominal values according to manufacturers’ indications, see also FRIALEN data sheet No. 50. * Compact component, connection between FRIALONG long coupler and excess flow valve fitted and checked by factory.   FRIALONG electrofusion coupler   * exposed heating coils for ideal heat transfer, * long insertion depth for firm guidance of pipes * extra long fusion zones * long cold zones at ends and in the centre to prevent flow of molten material   Additional features:   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * both sides of the pipe can be fused simultaneously * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * Individually packed in plastic bag including tips for installation, identification card giving characteristic product data including fixing options * temperature compensation (fusion time is automatically adjusted to ambient temperature) * clear markings indicating direction of installation * type plate indicating type to DVGW-VP305-2 * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting as well as the gas stop valve * all information regarding contact points may be accessed. * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration FRIALONG to VP 607, GW335 - B2 * DVGW-registration excess flow valve to VP305-2 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
|  |  | **Available in 5 designs:**  **Type A/D:** for power pressure 25 mbar - 1 bar, with bypass opening  **Type S:** for power pressure 200 mbar - 5 bar, with bypass opening  **Type SOU:** for power pressure 200 mbar - 5 bar, without bypass opening    **Type U:** for power pressure 35 mbar - 5 bar, without bypass opening  **Type UUE:** for power pressure 35 mbar - 5 bar, with bypass opening  **Available in the sizes:**  d 32  d 50  d 63 |  |  |

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|  | **Qty.** | **Text** | **UP** | **TP** |
| 1.8 |  | **MR reducer with integrated excess flow valve**  **(Sentry GS**®**):**  **MR STOP, System Maxitrol (Gas)**  **Features:**   * Electrofusion couplers in MR design with integrated safety device which automatically shuts off gas flow in the event of pipe damage, caused e.g. by digging or drilling work. Technical information and nominal values according to manufacturers’ indications, see also FRIALEN data sheet No. 60. * Compact component, connection between MR reducer and excess flow valve fitted and checked by factory.   Electrofusion reducer MR   * exposed heating coils for ideal heat transfer, * insertion depth in line with ISO maximum requirements * extra-wide fusion zones * extra-long zones at the sides and the centre to prevent flow of molten material   Additional features:   * dimensions PE 100/ SDR 11 * **H2 ready 20.** Our products are suitable for use with 20% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * both sides of the pipe can be fused simultaneously * exposed, firmly embedded heat transmitter, without PE coating, for optimum heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * Individually packed in plastic bag including tips for installation, identification card giving characteristic product data including fixing options * temperature compensation (fusion time is automatically adjusted to ambient temperature) * clear markings indicating direction of installation * type plate indicating type to DVGW-VP305-2 * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting as well as the gas stop valve * all information regarding contact points may be accessed. * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW-registration MR to VP 607, GW335 - B2 * DVGW-registration gas flow monitor to VP305-2 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
|  |  | **Available in 2 designs:**  **Type D:** for power pressure 25 mbar - 1 bar, with bypass opening  **Type Z:** for power pressure 35 mbar - 5 bar, with bypass opening  **Available in the sizes:**  d 50 / **40** Typ Z  d 63 / **32** Typ Z  d 63 / **40** Typ Z  d 63 / **50** Typ Z  d 63 / **32** Typ D  d 63 / **50** Typ D  **[bold]:** Dimension of excess flow valve**,** flow direction: **d** LARGE ⇒ **d** small |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 2.0 |  | **MV end caps** with integrated heating coils **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * compact component made from HD-PE * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * couplers with definite stop * insertion depth in line with ISO maximum requirements * extra-wide fusion zones * extra-long cold zones at the sides and in the middle for improved pipe guidance and to prevent flow of molten material. * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicator for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW-registration to VP 607, GW335 - B2   **Available in the sizes:**  d 20 d 90  d 25 d 110  d 32 d 125  d 40\* d 160  d 50 d 180  d 63 d 200  d 75 d 225  \* Also recommended as fused caps for the dome of FRIALEN-Pressure Tapping Tees DAA/DAP ≤ d63 (execution DAA without RED SNAP). |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 3.0 |  | **MV end caps** with integrated heating coils **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * compact component made from HD-PE * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * couplers with definite stop * insertion depth in line with ISO maximum requirements * extra-wide fusion zones * extra-long cold zones at the sides and in the middle for improved pipe guidance and to prevent flow of molten material. * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicator for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW-registration to VP 607, GW335 - B2   **Available in the sizes:**  d 20 / 16 d 50 / 40 d 110 / 63  d 32 / 16 d 63 / 32 d 110 / 90  d 32 / 20 d 63 / 40 d 125 / 90  d 32 / 25 d 63 / 50 d 125 / 110  d 40 / 20 d 75 / 63 d 160 / 110  d 40 / 25 d 90 / 50 d 180 / 125  d 40 / 32 d 90 / 63 d 225 / 160  d 50 / 25 d 90 / 75  d 50 / 32 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 4.0  4.1  4.11 |  | **W Elbows**  **with integrated heating coils**  **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * both sides of the pipe can be fused simultaneously * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * couplers with easily removable centre stop * insertion depth to maximum ISO requirement * extra-wide fusion zones (min. 35% of diameter) * extra-long cold zones at the sides and in the centre to improve pipe guidance and prevent flow of molten material * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 607, GW335 - B2   **45° and 90° elbows**  **Available in the sizes:**  d 20 (only W90°)  d 25  d 32 d 110 d 2501  d 40 d 125 d 2801  d 50 d 160 d 3151  d 63 d 180  d 75 d 200  d 90 d 225  1 separate fusion zones |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 4.12 |  | **30° elbows**  **Available in the sizes:**  d 90  d 110  d 125  d 160  d 180  d 200  d 225 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 5.0  5.1 |  | **I/A 11° Elbows WS11°** with integrated heating coils **Features:**   * I/A design: coupler / spigot * universal change of direction due to multiple application 11°/22°/33° or 45° + 11° ... * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * insertion depth to maximum ISO requirement * extra-wide fusion zones (min. 35% of diameter) * extra-long cold zones at the sides and in the centre to improve pipe guidance and prevent flow of molten material * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 607, GW335 - B2   **Available in the sizes:**  d 110  d 125  d 160  d 180  d 225 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 6.0  6.1 |  | **WET Swan neck bend** with integrated heating coils **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * exposed, firmly embedded, heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * insertion depth to maximum ISO requirement * extra-wide fusion zones (min. 35% of diameter) * extra-long zones at the sides and in the centre to improve pipe guidance and prevent flow of molten material * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 607, GW335 - B2   **Available in the sizes:**  d 32  d 40  d 50  d 631  1elbows execution in version 2 x W90° |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 7.0  7.1  7.11 |  | **90° T Pieces T**  **with integrated heating coils**  **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * couplers with easily removable centre stop * insertion depth to maximum ISO requirement * extra-wide fusion zones (min. 35% of diameter) * extra-long cold zones at the sides and in the centre to improve pipe guidance and to prevent flow of molten material * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 607, GW335 - B2   **90° T Pieces monofilar TA**  One fusion process for the simultaneous connection of both sides of the pipe in passage, with spigot outlet.  **Available in the sizes:**  d 20 / 201 d 40 / 401 d 90 / 902  d 25 / 251 d 50 / 501 d 110 / 1102  d 32 / 321 d 63 / 631 d 160 / 1602  1 with extra-long spigot outlet  2 with regular spigot outlet. |  |  |

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| 7.12  7.13  7.14 |  | **90° T-Pieces reduced TAred**  One fusion process for the simultaneous connection of both sides of the pipe in passage, with reduced spigot outlet.  **Available in the sizes:**  d 32 / 201 d 63 / 401 d 110 / 902 d 180 / 1802 d 225 / 902  d 40 / 321 d 63 / 501 d 160 / 902 d 200 / 902 d 225 / 1102  d 50 / 321 d 90 / 322 d 160 / 1102 d 200 / 1102 d 225 / 1602  d 50 / 401 d 90 / 632 d 160 / 1252 d 200 / 1602 d 225 / 2252  d 63 / 321 d 110 / 632 d 180 / 1252 d 200 / 2002 d 250 / 2252  d 280 / 2252  d 315 / 2252  1 with extra-long spigot outlet  2 with regular spigot outlet.  **90° T Piece with triangular electrofusion**  One fusion process for the simultaneous connection of both sides of the pipe in passage, separate fusion process to integrate branch.  .  **Available in the sizes:**  d 75 d 160 d 2501  d 90 d 180 d 2801  d 110 d 200 d 3151  d 125 d 225  1 Separate fusion process per connection  **90° T-Piece reduced, Tred**  **with electrofusion couplers in the passage and outlet pipe spigots**  Separate fusion process per connection in the passage, outlet with SDR11 pipe spigot  Other outlet dimensions can be created with MR reducers, e.g. FRIALEN MR d 225 / d 160  **Available in the sizes:**  d 250 / d 225 d 315 / d 225  d 280 / d 225 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 8.0  8.1 |  | **FRIALEN® - Y and YS Section Heating Coils**    **Y** (**pipe joint / Y section)**  **Features:**   * pipe joint / Y section for connecting flow and return pipes for geothermal sensors, each at one connection * for use in gas and water service pipes * dimensions d 32x32x40 and d 40x40x50, SDR 11 * material: PE 100 * **all connections with integrated electrofusion couplers,**   **no additional couplers required**   * with exposed heating coils for optimum heat transfer * faster assembly time due to integral heating coil * no time-consuming paring or scraping of the Y section required * **secure fusioning due to generous insertion depth of the couplings and integrated pipe guide, particularly with coiled piping** * **long fusion zones** * **long cold zones on the sides to prevent molten material from escaping** * flow-optimised inner contouring (Zeta values available upon request) * short cooling times * individually packed in plastic bags * temperature compensation (fusion time is automatically adapted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * all information can be recorded in the vicinity of the contact point * safety contacts for secure, touch-protected connection of fusion units * minimum voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * quality monitored in compliance with Wurzburg SKZ directives * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to GW335 – B2 * SKZ label A 500 (SKZ HR 3.26)   **Available in the sizes:**  Y d32-d32-d40 (Ref.-No. 640034)  Y d40-d40-d50 (Ref.-No. 640036) |  |  |

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| 8.2 |  | **YS (pipe joint / YS section)**  **Features:**   * pipe joint / YS section for connecting flow and return pipes, e.g. for dual circulation FRIALEN geothermal sensors, each at one connection * for use in gas and water service pipes * dimensions d 32x32x40 and d 40x40x50, SDR 11 * material: PE 100 * **2x connections with integrated electrofusion couplers, no additional couplers required** * 1x SDR11 pipe spigot, e.g. for fusioning with FRIALEN UB coupler or FRIALEN W90° elbow for direct and freely alignable transitions in horizontal installations * with exposed heating coils for optimum heat transfer * faster assembly time due to integral heating coil * no time-consuming paring or scraping due to integrated couplers * **secure fusioning due to generous insertion depth of the couplings and integrated pipe guide, particularly with coiled piping** * **long fusion zones** * **long cold zones on the sides to prevent molten material from escaping** * flow-optimised inner contouring (Zeta values available upon request) * short cooling times * individually packed in plastic bags * temperature compensation (fusion time is automatically adapted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * all information can be recorded in the vicinity of the contact point * safety contacts for secure, touch-protected connection of fusion units * minimum voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * quality monitored in compliance with Wurzburg SKZ directives * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to GW335 – B2 * SKZ label A 500 (SKZ HR 3.26)   **Available in the sizes:**  YS d32-d32-d40 (Ref. No. 640035; d 40 = pipe spigot)  YS d40-d40-d50 (Ref. No. 640037; d 50 = pipe spigot) |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 9.0  9.1 |  | **HD-PE / Steel Adapters**  **for gas pipes**  **USTR/USTN/USTM**  **with integrated heating coils**  **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH. * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * steel side permanently and immovably anchored in HD-PE * self-sealing, patented seal geometry requiring no flexible seal * coupler with fixed stop * insertion depth to maximum ISO requirement * extra-wide fusion zones (minimum 35 % of diameter) * extra-long cold zones at the sides and in the centre to improve pipe guidance and prevent flow of molten material * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 600 * Steel pipes according to DIN EN 10208-1, Welding bevel design B according to DIN 2470 * Brass material / gunmetal according to DVGW GW393 and UBA recommendation for metallic materials suitable for drinking water hygiene |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 9.11  9.12  9.13 |  | USTR: with fusion end for steel pipes Steel pipe spigots with markings by restamping for gas networks ≤ 10 bar operating pressure  **Available in the sizes:**  d 110/ DN 100  d 32/ DN 25 d 125/ DN 100  d 40/ DN 32 d 160/ DN 150  d 50/ DN 40 d 180/ DN 150  d 63/ DN 50 d 200/ DN 200  d 90/ DN 80 d 225/ DN 200  **With external thread (according to DIN 2999)**  **USTN:**  **straight design**    d/ R 32/ 1"  d/ R 40/ 1¼"  d/ R 50/ 1½"  d/ R 63/ 2"  **With internal thread (according to DIN 2999)**  **USTM:**  **straight design**    d/ Rp 32/ 1"  d/ Rp 40/ 1¼"  d/ Rp 50/ 1½"  d/ Rp 63/ 2" |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 9.2  9.21 |  | **USTRS** **Transition Fittings HD-PE / Steel**  **Spigot Fittings**  **Features:**   * dimension PE 100/ SDR 11 * steel side permanently and immovably anchored in HD-PE * self-sealing patented seal geometry, requiring no flexible seal * insulation provided by injection moulded protective pipe * individually packed in plastic bag * barcoding allows automatic traceability of the fitting * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 600   **USTRS: fusion end for steel pipes**  Steel pipe spigots with markings by restamping for gas networks ≤ 10 bar operating pressure    **Available in the sizes:**  d 20/ DN 15 d 160/ DN 150  d 25/ DN 20 d 180/ DN 150  d 32/ DN 25 d 200/ DN 200  d 40/ DN 32 d 225/ DN 200  d 50/ DN 40 d 250/ DN 250  d 63/ DN 50 d 280/ DN 250  d 75/ DN 65 d 315/ DN 300  d 90/ DN 80 d 355/ DN 300  d 110/ DN 100 d 400/ DN 400  d 125/ DN 100 d 500/ DN 500  d 140/ DN 125 d 630/ DN 600 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 10.0  10.1 |  | **Transition Fittings HD-PE / brass, V2A or gunmetal**  **for gas – water pipes**  **MUN, MUM, WUN45°, WUN90°, UAN, UAM**  **With integrated heating coils**  **Features:**   * dimension PE 100/ SDR 11 * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * brass or gunmetal side permanently and immovably anchored in HD-PE * self-sealing, patented seal geometry, requiring no flexible seal * couplers with fixed stop * insertion depth to maximum ISO requirement * extra wide fusion zones (min. 35 % of diameter) * extra-long cold zones at the sides and in the centre to improve pipe guidance and prevent flow of molten material * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 600 * Brass material / gunmetal according to DVGW GW393 and UBA recommendation for metallic materials suitable for drinking water hygiene |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 10.11  10.12 |  | **With external thread (brass)**  **Available in the sizes:**  **straight design MUN** **elbow 90° WUN90°**  d/ R 32/ 1" d/ R 32/ 1"  d/ R 32/ 1¼" d/ R 32/ 1½"  d/ R 32/ 1½" d/ R 40/ 1"  d/ R 40/ 1" d/ R 40/ 1¼"  d/ R 40/ 1¼" d/ R 40/ 1½"  d/ R 40/ 1½" d/ R 50/ 1"  d/ R 40/ 2" d/ R 50/ 1¼"  d/ R 50/ 1" d/ R 50/ 1½"  d/ R 50/ 1¼" d/ R 63/ 1½"  d/ R 50/ 1½" d/ R 63/ 2"  d/ R 50/ 2"  d/ R 63/ 1¼"  d/ R 63/ 1½"  d/ R 63/ 2"  d/ R 75/ 2"  d/ R 75/ 2½"  **With external thread (stainless steel - V2A)**  **Available in the sizes:**  **straight design MUN** **elbow 90° WUN90°**  d/ R 40/ 1" d/ R 40/ 1"  d/ R 40/ 1½" d/ R 40/ 1½"  d/ R 50/ 1½" d/ R 50/ 1½"  d/ R 63/ 1½" d/ R 63/ 1½"  d/ R 63/ 2" d/ R 63/ 2"  **With internal thread (gunmetal)**  **Available in the sizes:**  **straight design MUM**  d/ Rp 32/ 1"  d/ Rp 40/ 1¼"  d/ Rp 50/ 1½"  d/ Rp 63/ 1½"  d/ Rp 63/ 2" |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 10.2  10.21  10.22  10.23 |  | **Universal adapter with HD-PE side as pipe spigot**  **Features:**   * dimension PE 100/ SDR 11 * brass side permanently and immovably anchored in PE pipe spigot * storage not subject to location * individually packed in plastic bag * barcoding allows automatic traceability of the fitting * acceptance certificate to DIN EN 10 204 - 3.1 on request   **With external thread (brass)** **UAN**  **Available in the sizes:**  d/ R 20/ ½" d/ R 63/ 2“  d/ R 25/ ¾" d/ R 75/ 2½“  d/ R 32/ 1" d/ R 90/ 3“  d/ R 40/ 1¼" d/ R 110/ 4“  d/ R 50/ 1½“ d/ R 125/ 4“  d/ R 63/ 1½“  **With internal thread (brass) UAM**  **Available in the sizes:**  d/ Rp 20/ ½" d/ Rp 63/ 2“  d/ Rp 25/ ¾" d/ Rp 75/ 2½“  d/ Rp 32/ 1" d/ Rp 90/ 3“  d/ Rp 40/ 1¼" d/ Rp 110/ 4“  d/ Rp 50/ 1½“ d/ Rp 125/ 4“  d/ Rp 63/ 1½“  **Travelling nut with internal thread (brass) UAM ET**  **Available in the sizes:**  d/ Rp 25/ ¾"  d/ Rp 32/ 1"  d/ Rp 40/ 1¼"  d/ Rp 50/ 1½"  d/ Rp 63/ 1½"  d/ Rp 63/ 2" |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 10.3 |  | **Transition Fittings for liquid gas HD-PE / copper** **UFLG**  Compact component as material adapter in connection area of liquid gas supply utilities for the operation of consumption plants out of the gas phase.  **Features:**   * dimension PE 100/ SDR 11 * exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion:   ⇒ installation possible without holding device  ⇒ short cooling times   * copper side permanently and immovably anchored in HD-PE * copper side made from SF Cu-F25, DIN 1787 can be connected to copper pipe through hard-soldering (coupler soldering). * self-sealing, patented seal geometry requiring no elastic seal * couplers with fixed stop * insertion depth to maximum ISO requirement * extra-wide fusion zones (min. 35 % of diameter) * extra-long cold zones at the sides and in the centre to improve pipe guidance and prevent flow of molten material * Individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * minimal voltage used during processing * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 600   **Available in the sizes:**  d 32/ DN 20 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | | **TP** |
| 11.0  11.1 |  | **Tapping Tees**    **DAA** **Pressure Tapping Tees with fast clamping lever and with integrated drill**  Area of application up to 16 bar (water) or 10 bar (gas) Features:  * dimension SDR 11/ PE 100 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * solid injection moulded part moulded as one piece * simple, fast and reliable assembly of the DAA with a underclamp with fast clamping lever, without additional tools * DAA is one unit with captive parts, without loosen or pre-mounted parts * the underclamp is flexible, to manage large pipe tolerances, pipe- ovalities up to 1.5%, expanded pipes up to 3% (up to dim. d 160) and 2% (> dim. d 160) and to provide always an optimal and uniform buildup of melt pressure during the fusion process * integrated, exposed heating coils in apex area for direct heat transfer to fusion surface of pipe. * extra wide fusion zone * barcode position exposed on fast clamping lever for easy scanning with readerwand or barcode scanner * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * fusion indicators for visual proof that fusion has been carried out * cutter made from corrosion resistant metal:   \* appropriate for drinking water  \* temporary shutting down of operation possible  \* no jerking (jumping) of cutter  \* rotating cutter, low torque, fast, swarf free drilling guaranteed even for large pipe-dimensions, large wall thickness and low temperatures   * drilling absolutely swarf free * punched-out pipe piece fits securely in the cutter * cutter is placed outside of passage, low pressure loss * leak free tapping under operating pressure up to 16 bar (water) or 10 bar (gas) without additional tools * solid upper and lower stops of cutter – ensuring defined maximum tapping length and safe return rotation of cutter * cutter with integrated torque limiter, for protection against overcharge, damage of the DAA or uncontrollable discharge of gas/water * only one hexagonal wrench key with wrench size 17 for tapping all dimensions and for installing the plug was required * length of outlet spigot designed for 2 fusion processes * outlet spigot prepared to receive excess flow valve * sealing plug radially sealed using internally sealing O–ring, provides reliable seal at tapping dome against internal diameter. * no elastomer O-ring in direct contact to gas/water * after tapping, stack can be fused non-accessible with FRIALEN cap K d 50 (ultimate protection against any access) * individually packed in plastic bag for dirt protection * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request |  | |  |
|  |  | **Available in dimensions: (\*supplied in kit version with reducer MR d63/40 or MR d63/50 included)**  d 40/20 d 90/63 d 160/25  d 40/25 d 110/20 d 160/32  d 40/32 d 110/25 d 160/40\*  d 50/20 d 110/32 d 160/50\*  d 50/25 d 110/40\* d 160/63  d 50/32 d 110/50\* d 180/20  d 63/20 d 110/63 d 180/25  d 63/25 d 125/20 d 180/32  d 63/32 d 125/25 d 180/50\*  d 63/40\* d 125/32 d 180/63  d 63/63 d 125/40\* d 200/32  d 75/32 d 125/50\* d 200/63  d 90/20 d 125/63 d 225/32  d 90/25 d 140/32 d 225/50\*  d 90/32 d 140/63 d 225/63  d 90/40\* d 160/20  d 90/50\* |  | |  |
| **Item** | **Qty.** | **Text** | | **UP** | **TP** |
| 11.2 |  | **Pressure Tapping Tees Top-Loading DAA TL**  **Features:**   * Integrated, exposed heating coils in apex area for direct heat transfer to fusion surface of pipe. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * for flexible adaptation to all pipe diameters from d 250 – d 400/63. * other outlet dimensions may be created using reducer couplers (Item 3). * **for further features please refer to Item 10.1.**   **Areas of Application:**  d 250 – d 315/63: Tapping pipe SDR 17.6 – SDR 11  d 355 – d 400/63: Tapping pipe SDR 17.6/ 17  **Assembly advice:**   * Clamping onto pipe takes place before or during fusion using FRIALEN® clamping device FRIATOP (see Item 20). | |  |  |

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| **Item** | **Qty.** | **Text** | | **UP** | **TP** |
| 11.3  11.4 |  | **Pressure Tapping Tee with parallel dome DAP**  **for space saving horizontal installation**  **Features:**   * integrated, exposed heating coils in apex area for direct heat transfer to fusion surface of pipe. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * outlet spigot and tapping dome protected from excavator damage by parallel location. * other outlet dimensions may be created using reducer couplers (Item 3). * **for further features refer to Item 10.1**   **Available in the sizes:**  d 63/32 d 125/32 d 180/32  d 110/32 d 125/50 d 180/50  d 110/50 d 160/32 d 225/32  d 160/50 d 225/50  **Cap for Pressure Tapping Tees** **DK**  **Electrofusion-Cap DK for final sealing of the drill socket (stack) of a Pressure Tapping Tee DAA, DAA TL and DAP**  **Features:**   * dimension SDR 11/ PE 100 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * maximum working pressure 16 bar (water) / 10 bar (gas) * maximum stability through great wall thickness * exposed heating coils for optimal heat transfer to the pipe * small annular gap for build-up of optimum joining pressure in the fusion zone * large insertion depth for ease of pipe guiding * cold zones at the end to prevent the flow of molten material * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting (Traceability-Coding) * touch proof electric contacts * durable batch marking * individually wrapped for dirt protection * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Available in the sizes:**  d 50 | |  |  |
| **Item** | **Qty.** | **Text** | **UP** | | **TP** |
| 12.0  12.1 |  | **Pressure Tapping Valves**  **Pressure Tapping Valves DAV Classic with integrated drill**  Area of application up to 16 bar (water) or 10 bar (gas)  (Execution with screwed underclamp) Features:  * compact component, solid injection moulded part moulded as one piece * valve body made from PE100 * stainless steel spindle * no risk of corrosion i.e. no need for elaborate protective measures against corrosion * retrospective tapping possible from street cap via lever system * valve may be opened/shut completely by only 10 rotations * drill, valve and spindle made from corrosion resistant stainless steel. * rotating drill, low torque, swarf free drillings guaranteed even with large dimensions * completely leak and swarf free tapping under pressure up to 16 bar (water) or 10 bar (gas) * no jerking (jumping) of drill – consistent tapping possible using standard water key * triple sealing system for inner sealing with regard to the house connection * triple sealing system for external sealing with regard to the installation area * solid upper and lower stops – ensuring defined maximum tapping length and safe return rotation of drill * upper and lower stops fixed at > 150 Nm * external tapping device not required * scraper ring at spindle passage prevents dirt entering sealing area * preassembled fixing elements, cannot be lost, for easy assembly – even in the trench – no need for special tools * integrated, exposed heating coils in apex fusion area for direct heat transfer to fusion surface of pipe. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * length of outlet spigot designed for two fusion processes * EBS assembly lever system adapted specially for DAV. * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 304 (gas) or VP 610 / W336 (water) |  | |  |

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| 12.2 |  | **Available in the sizes:**  d 50/32  d 63/32  d 63/40  d 75/32  **Pressure Tapping Valves Top-Loading DAV TL**  **Features:**   * flexible adaptation to all pipe diameters in indicated range of dimensions using FRIATOP clamping device. * integrated, exposed heating coils in apex area for direct heat transfer to fusion surface of pipe. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * **for additional features see 11.1**   **Available for pipes SDR 17.6 – SDR 11 in dimensions:**  d 250 – d 315/63  d 355 – d 400/63  **Assembly advice:**  May be clamped onto pipe before or during fusion using FRIALEN®-clamping device FRIATOP (see Item 20) |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 12.3 |  | **Pressure Tapping Valves DAV/DAV ACW with fast clamping lever “RED SNAP” and with integrated drill**  Area of application up to 16 bar (water) or 10 bar (gas) Features:  * Dimension SDR 11 / PE 100 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * Compact component, solid injection moulded part moulded as one piece * Simple, fast and reliable assembly of the DAV with a underclamp with fast clamping lever RED SNAP, without additional tools * DAV is one unit with captive parts, without loosen or pre-mounted parts * The underclamp is flexible, to manage large pipe tolerances, pipe-ovalities up to 1.5%, expanded pipes up to 3 %, and provide always an optimal and uniform build-up of melt pressure during the fusion process. * Because of the new and innovative fast clamping lever RED SNAP, the assembly time is significant reduced * Integrated, exposed heating coils in apex fusion area for direct heat transfer to the fusion surface of pipe * Extra-wide fusion zones * Barcode position exposed on the fast clamping lever RED SNAP for easy scanning with readerwand or barcode scanner * Temperature compensation, fusion time is automatically adjusted to ambient temperature * Barcode allows automatic traceability of the fitting * Safety contacts for secure, touch protected connection of fusion units * Fusion indicators for visual proof that fusion has been carried out * Cutter made from stainless-steel, spindle made from corrosion resistant metal: \* appropriate for drinking water \* no jerking (jumping) of cutter * Consistent – even later via FRIALEN DBS – tapping by using standard water key is possible * Rotating drill, low torque, easy tapping even with large pipe dimensions, pipe wall thickness and low temperatures * Drilling absolutely swarf free * Punched-out pipe piece fits securely and permanent in the cutter * Cutter is placed outside of passage, low pressure lost * Completely leak and swarf free tapping under pressure up to 16 bar (water) or 10 bar (gas) without additional tool * Solid (metallic) upper and lower drill stops – ensuring defined maximum tapping length and safe return rotation of drill * Upper and lower stops fixed at > 150 Nm * Valve may be opened/shut completely by only 8 or 9 rotations * Length of outlet spigot designed for two fusion processes * Outlet spigot prepared to receive excess flow valve * No risk of corrosion i.e. no need for elaborate protective measures against corrosion * Triple sealing system for inner sealing with regards to the house connection * Triple sealing system for external sealing with regards to the installation area * External tapping device not required * Scraper ring at spindle passage prevents dirt entering sealing area * Special installation set DBS, wrench size 14 mm, with sleeve tube bell with integrated locking function adapted specially for the DAV * Thanks to the integrated locking function and the cut-outs on the tapping stack of the DAV, a firm and dirt-tight connection between the installation set and the DAV is ensured * Individually packed in plastic bag for dirt protection * Permanently stamped batch identification * Acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 304 (gas) or W 336 (water)   **Available in the sizes:**  d 50/321 d 110/321 d 140/631 d 200/321  d 63/321 d 110/40 d 160/321 d 200/631  d 63/40\* d 110/50 d 160/40 d 225/321  d 63/631 d 110/631 d 160/50 d 225/40  d 75/321 d 125/321 d 160/631 d 225/50  d 90/321  d 125/40 d 180/321 d 225/631  d 90/40 d 125/50 d 180/40  d 90/50 d 125/631 d 180/50  d 90/631  d 140/321  d 180/631  \* = supplied in kit version including reducer coupler MR d 63/40  1 also available as **DAV ACW** – closing in an anti-clockwise direction |  |  |

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| 12.4 |  | **Installation kit for Pressure Tapping Valves DBS** Features:  * Telescopic installation kit DBS enables the house connection line to be shut off and reopened by the FRIALEN pressure tapping valve DAV RED SNAP via the surface box. * In addition, a subsequent tapping can also be carried out. * The installation kit is in length range (RD = pipe covers) infinitely adjustable without tools, even when installed. * Self-supporting in every position. * Installation kit DBS has a sleeve tube bell with integrated locking function. * With the integrated locking function, a permanent and longitudinal force-fit connection with the DAV RED SNAP is ensured. This prevents unintentional release of the installation kit. * A foam rubber ring, which can optionally be used, in the sleeve tube bell ensures that no dirt can penetrate. * Compact construction. * Ideal and safe torque transmission onto the DAV RED SNAP. * Corrosion resistant. * Universally applicable for FRIALEN pressure tapping valves DAV and DAV RED SNAP.   **Available in the sizes:**  RD 0,7 – 1,0 m RD 1,2 – 1,8 m  RD 0,9 – 1,3 m RD 1,8 – 2,7 m  RD 2,6 – 3,5 m |  |  |

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| 13.0  13.1  13.2 |  | **Shut-off Saddles**  **Shut-off Saddles SPA**  **Including brass plugs with integrated square and throw-on screw cap** Features:  * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * compact component to receive standard shut-off saddles * integrated, exposed heating coils in apex area for direct heat transmission to fusion surface of pipe. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * metallic external guiding thread for easy assembly of shut-off saddle * brass internal and external thread permanently and immovably anchored in HD-PE. Thread to DIN ISO 228 * dome is access protected by fusion of * SPA d 63: **FRIALEN**®-Cap **K d 50.** * SPA **≥** d 90: **FRIALEN**®**-Cap SPAK**. * acceptance certificate to DIN EN 10 204 - 3.1 B on request * DVGW registration to GW 335-B2 and VP 600   **Available in the sizes:**  d/ R d 63/ 1½"\* d/ R d 160/ 2½"  d/ R d 90/ 2½" d/ R d 180/ 2½"  d/ R d 110/ 2½" d/ R d 200/ 2½"  d/ R d 125/ 2½" d/ R d 225/ 2½"  \* only for processing with pipes SDR 11  **Top-Loading Shut-off Saddles SPA TL**  **including brass plugs with integrated square and throw-on HD-PE screw cap**  **Features:**  - flexible adaptation to all pipe diameters in indicated range of dimensions using FRIATOP clamping device. Integrated, exposed heating coils in apex area for direct heat transfer to fusion surface of pipe.  - **for additional features see Item 12.1.** |  |  |

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| 13.3 |  | **Available in dimensions:**  d 250 - d 355 (560)/ R 2½"  (may be fused up to d 560, please observe advice by shut-off saddle manufacturer)  **Assembly advice:**   * clamping to pipe should take place before or during fusion using FRIALEN® clamping device FRIATOP (see Item 20).   **Cap for Shut-off Saddles SPAK**  Electrofusion-Cap SPAK for final sealing of the drill socket (stack) of a Shut off Saddle SPA ≥ d90 or SPA TL.  **Features:**   * dimension SDR 11/ PE 100 * maximum working pressure 16 bar (water) / 10 bar (gas) * maximum stability through great wall thickness * exposed heating coils for optimal heat transfer to the pipe * small annular gap for build-up of optimum joining pressure in the fusion zone * large insertion depth for ease of pipe guiding * cold zones at the end to prevent the flow of molten material * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting (Traceability-Coding) * touch proof electric contacts * fusion indicator for visual fusion control * durable batch marking * individually wrapped for dirt protection * acceptance certificate to DIN EN 10 204 - 3.1 B on request   **Available in the sizes:**  d 75 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 14.0  14.1 |  | **Spigot Saddles**  **Spigot Saddles SA**  For retrospective tapping of PE pipes using a separate tapping tool.  **Features:**   * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * integrated, exposed heating coils in apex area for direct heat transfer to fusion area of pipe. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * premounted fixing elements, cannot be lost, for simple assembly – even in the trench. * alternative for reduced T pieces * tapping via additional shut-off element, e.g. ball valve, under maximum operating pressure of mains * acceptance certificate to DIN EN 10 204- 3.1 on request * DVGW registration to VP 607, GW335 – B2   **Available in the sizes:**   |  |  |  |  | | --- | --- | --- | --- | | d 63/ 32 | d 110/ 63 | d 160/ 63 | d 180/ 125 | | d 63/ 50 | d 110/ 90 | d 160/ 90 | d 200/ 63 | | d 75/ 50 | d 125/ 32 | d 160/ 110 | d 225/ 63 | | d 90/ 32 | d 125/ 63 | d 160/ 125 | d 225/ 90 | | d 90/ 63 | d 125/ 90 | d 180/ 63 | d 225/ 110 | | d 110/ 32 | d 125/ 110 | d 180/ 90 | d 225/ 125 | | d 110/ 50 | d 160/ 32 | d 180/ 110 | d 225/ 160 | |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 14.2 |  | **Spigot Saddles Top-Loading SA TL**  For the retrospective tapping of PE pipes in pressure free condition by using FRIALEN tapping tool  **Features:**  - flexible adaptation to all pipe diameters in indicated range of dimensions using FRIATOP clamping device (see Item 20).   * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH   - **for additional features see Item 14.1**  **Available in the sizes:**  d 250 - 560/ 32  d 250 - 560/ 63  Other outlet sizes may be created with reducer couplers (Item 3)  **Assembly advice**:   * clamping onto pipe takes place before or during fusion using FRIALEN clamping device FRIATOP (see Item 20). |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 14.3  14.4 |  | **Spigot Saddles with Flange Outlet SA FL**  **Features:**   * HD-PE compact component. * factory created combination of FRIALEN spigot saddle, fusion coupler and FRIALEN flange EFL (fixed flange). * flange connection dimensions to DIN 2501, part 1. * **for further features see Items 14.1** **and 17.0**   **Available in the sizes:**  d 110/ DN 80 d 160/ DN 100  d 125/ DN 80 d 225/ DN 100  d 160/ DN 80  d 180/ DN 80  d 225/ DN 80  **Spigot Saddles SA VL**  Spigot saddle with large outlet spigot for retrospective tapping of large PE pipes using a separate tapping tool.  Alternative for reduced T-pieces.  Clamped into place by a vacuum using the FRIATOOLS clamping tool FRIALOAD. Pipes are tapped using the FRIATOOLS FWAB tapping set for pressure-free piping.  **Features:**   * dimension PE 100/SDR 11 or SDR 17 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * circular integral seal in saddle area * for assembly anywhere on the pipe, no all-round access necessary * practically swarf-free tapping for minimum pressure loss * integrated, exposed heating coils in apex area for direct heat transfer to fusion surface of pipe. * temperature compensation (fusion time is adapted to ambient temperature) * barcoding allows automatic traceability of the fitting * main piping can be tapped under maximum permitted operating pressure using additional shut-off element, e.g., FRIALOC PE shut-off valve; please contact our Application Engineering department regarding tapping with operating pressure * acceptance certificate to DIN EN 10 204 - 3.1 on request |  |  |

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|  |  | **Available in the sizes:**   * **SDR 11 (max. working pressure 16 bar (Water) / 10 bar (Gas))**     d 400/ d 225 d 630/ d 315 d 900/ d 280  d 400/ d 250 d 630/ d 355 d 900/ d 315  d 450/ d 225 d 630/ d 400 d 900/ d 355  d 450/ d 250 d 710/ d 225 d 900/ d 400  d 500/ d 225 d 710/ d 250 d 1000/ d 225  d 500/ d 250 d 710/ d 280 d 1000/ d 250  d 500/ d 280 d 710/ d 315 d 1000/ d 280  d 500/ d 315 d 710/ d 355 d 1000/ d 315  d 560/ d 225 d 710/ d 400 d 1000/ d 355  d 560/ d 250 d 800/ d 225 d 1000/ d 400  d 560/ d 280 d 800/ d 250 d 1200/ d 225  d 560/ d 315 d 800/ d 280 d 1200/ d 250  d 560/ d 355 d 800/ d 315 d 1200/ d 280  d 560/ d 400 d 800/ d 355 d 1200/ d 315  d 630/ d 225 d 800/ d 400 d 1200/ d 355  d 630/ d 250 d 900/ d 225 d 1200/ d 400  d 630/ d 280 d 900/ d 250     * **SDR 17 (max. working pressure 10 bar (Wasser) / 5 bar (Gas))**   d 1000/ d 160  d 1200/ d 160 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 14.5 |  | **Spigot Saddles SA UNI**  Spigot saddle with outlet spigot d 90, d 110, d 125 and d 160 for creating a branch or vent of PE pipes d 250 to d 900.  Tapping is carried out with a separate tapping tool.  The spigot saddle SA UNI is an ideal alternative to the costly use of a T-piece.  Clamped into place by using the FRIATOOLS clamping tool UNITOP. Pipes are tapped using the FRIATOOLS tapping set FWAB for pressure-free piping (see Item 24).  **Features:**   * dimension PE 100 / SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * maximum working pressure 16 bar (water) and 10 bar (gas) * processable to pipes SDR 11 to 26 * large processing-range from d 250 to d 900 is covered with only three spigot saddle’s dimensions * easy and safe assembly with the clamping tool UNITOP * variable adaptation to all pipe diameters in the indicated range of dimensions by using the clamping tool UNITOP (see Item 23.0) * a leak test can take place with the pressure testing device FWDPA SA before tapping (see Item 25) * burr-free and almost flush tapping for maximum hydraulic performance (minimum pressure loss) * the heating element of the saddle fusion is not damaged by tapping and the fusion zone is not reduced * integrated, exposed heating coils in apex area for direct heat transfer to fusion surface of pipe guarantees maximum reliability and safety * temperature compensation (fusion time is adapted to ambient temperature) * barcoding for automatic recording of fusion parameters * barcoding allows automatic traceability of the fitting * main pipe can be fused and tapped under maximum working pressure * fusion indicator for visual fusion control * durable batch marking * individually wrapped for dirt protection * acceptance certificate to DIN EN 10 204 - 3.1 on request |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
|  |  | **Available in the sizes:**    d 250 – 280 / 90  d 250 – 280 / 110  d 250 – 280 / 125  d 250 – 280 / 160  d 315 – 400 / 90  d 315 – 400 / 110  d 315 – 400 / 125  d 315 – 400 / 160  d 450 – 900 / 90  d 450 – 900 / 110  d 450 – 900 / 125  d 450 – 900 / 160 |  |  |

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| **Item** | **Qty.** | **Text** | | **UP** | **TP** |
| 15.0  15.1 |  | **PE Shut-off valves**  **FRIALOC®****PE Shut-off Valves**  **for water service pipes**  compliant with DIN EN 805 and DVGW W400  **“Flap valve” system**  **Features:**   * dimension PE 100 / SDR 11 * maximum permitted operating pressure PN/PFA 16 bar (water) * pipe identical passage SDR 11 (up to d 180), piggable, * especially low-pressure loss * two-flap mechanism for reliable shut-off under all operating conditions * high-quality shut-off flaps made of polyamide * “breathing” flap flexibly adapts itself to casing contours * progressive sealing: flexible shut-off flaps allow clamping pressure to increase when internal pressure rises * no anti-corrosion measures necessary because casing and fusion ends are made of HD-PE, spindle is stainless steel * casing components are homogeneous and inseparable, no mechanical joints * pipe connection spigots compliant with EN12201-2 for homogeneous material installation using heating coil fittings. Other installation options with fusion flanges or mechanical connection system * extra-long pipe connection spigots designed for 2 fused joints (up to d 180) * forced flushing: no dead areas, no stagnant water * minimised sealing area, reduced microbiological growth * contour seal made of EPDM, inseparably joined to flap * low actuating moment even at full differential pressure * proven low-wear drive unit * low speed required for actuation (9 to 14 rotations) * drive unit features fixed metal end stops (400 nm) * barcoding allows automatic traceability of the fitting. Manufacturing and inspection details are stored for every single component. Data is archived for 10 years. * permanent identification ring with individual component number for traceability including the batch number of the components and inspection details * every fitting is subjected to leakage, tensile strength and function tests. * low weight * maintenance-free design * large contact surface for stable positioning at the bottom of the trench * individually packed in boxes * special contouring for high-tensile and dirt-proof connection to FRIALEN-FBS sheath pipe * acceptance certificate to DIN EN 10 204 - 3.1 on request | |  |  |
| **Item** | **Qty.** | **Text** | **UP** | | **TP** |
| 15.2 |  | * KTW certificates and W270 approval available * DVGW registration to DVGW W364   **Available in the sizes:**  d 90 d 110 d 125  d 160 d 180 d 200\*  d 225\* d 250\*  \* limited passage corresponds to dim. d 180  FRIALOC dim. d 200 and d 250 on request  **Installation kits for** **FRIALOC® FBS**  Telescopic lever for operating FRIALOC® PE Shut-off Valve from duct cover.  **Features:**   * telescopic installation set with stainless steel lever * alternative: steel lever, St 37 hot-dip galvanised * variably adjustable without tools in given range (pipe cover H) even when installed * self-supporting in every extended position * non-corroding * connecting pins made of stainless steel * GGG dome coupler, hot-dip galvanised * dome coupler with integral KlickFix® catch, no additional split pin required, simple attachment at the building site with no losable small parts * sheath pipes, welded PE cones * designed for spanner width (spanner size) 30   **Available in the sizes:**  0,75 – 1,0 m  0,9 – 1,3 m  1,2 - 1,8 m  1,5 - 2,3 m |  | |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 16.0  16.1 |  | **Ball Valves**  **Ball Valve KHP**  Area of application up to 10 bar (gas) **Features:**  * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * permanent HD-PE operation shut-off valves * corrosion proof, as housing, ball and HD-PE fusible ends (no need for corrosion preventative measures). * maintenance free, same service life as entire pipe system * immune to chemical and electrical reactions * low activating element, low weight * resistance to stop > 150 Nm * floating ball * double axial seal in ball axis * no deposits in internal areas * particularly low-pressure loss, optimum flow speed * BS activating lever system matched specifically to ball valves * barcoding allows automatic traceability of the fitting * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 302 (Gas)   **Double spigot length for double fusion**  **Available in the sizes:**  d 32 d 63 d 125  d 40 d 90  d 50 d 110  **Available in the sizes:**  d 160 d 200  d 180 d 225 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 16.2 |  | **Ball Valve with pipe identical Passage KH**  Area of Application up to 10 bar (gas) **Features:**  * valve passage without restriction corresponding to internal diameter of pipe spigot providing optimum hydraulics * passage may be cleaned * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * permanent HD-PE operation shut-off valves * corrosion proof due to HD-PE housing, ball and ends to be fused (no need for any preventative measures). * maintenance free, identical service life to entire pipe system * immune to chemical and electric reactions * low activating element, low weight * resistance to stop > 150 Nm * floating ball * double axial seal in ball axis * opening/closing ¼ rotation * no deposits on internal surfaces * KBS activating lever system specially adapted to ball valves * barcoding allows automatic traceability of the fitting * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 302 (gas)   **Available in the sizes:**  d 20  d 25  d 32  d 40  d 50\*  d 63  d 90  d 110  d 125  \* KBS d 63 – d 225 is required |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 16.3 |  | **Ball Valve with pipe identical Passage KHW**  Area of Application up to 16 bar (water) **Features:**  * valve passage without restriction corresponding to internal diameter of pipe spigot providing optimum hydraulics * passage may be cleaned * dimension PE 100/ SDR 11 * permanent HD-PE operation shut-off valves * corrosion proof due to HD-PE housing, ball and ends to be fused (no need for any preventative measures). * maintenance free, identical service life to entire pipe system * immune to chemical and electric reactions * low activating element, low weight * resistance to stop > 150 Nm * floating ball * double axial seal in ball axis * opening/closing ¼ rotation * no deposits on internal surfaces * KBS activating lever system specially adapted to ball valves * barcoding allows automatic traceability of the fitting * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 302 (gas)   **Available in the sizes:**  d 32  d 40  d 50\*  d 63  \* KBS d 63 – d 225 is required |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 16.4  16.5 |  | **Tapping Ball Valve AKHP**  Area of Application up to 10 bar (gas)  **Combination of HD-PE ball valve and weld-on saddle**  **Features:**   * HD-PE compact component * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * tapping of mains under gas or water pressure, without escape of gas or water * tapping from the side * installation of mains and service pipe takes place on one level * integration tasks reduced to minimum. * the ball valve may afterwards be used as a shut-off element. * **for additional features see Items 16.1**   **Available in the sizes:**  d 110/ 63 d 160/ 63 d 225/ 90  d 110/ 90 d 160/ 90  d 125/ 90 d 180/ 90 Assembly advice  * use external tapping tool for tapping of HD-PE pipe through opened FRIALEN® tapping ball valve.   - we recommend the tapping tool by Fa. Hütz + Baumgarten.  **Tapping Ball Valve Top-Loading AKHP TL**  A combination of HD-PE ball valve and weld-on saddle for the flexible adaptation to all pipe diameters in indicated range of dimensions.  **Features: see Items 16.4**  **Available in the sizes:**  d 250 – 450 (560) / 90 **Assembly Advice**  * use an external tapping tool for tapping the HD-PE pipe through the opened FRIALEN® tapping ball valve. * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * the FRIALEN® FRIATOP clamping device (see Item 20) is required for clamping onto the pipe before or during the fusion process. * we recommend the tapping tool by Fa. Hütz + Baumgarten. |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 16.6 |  | **Installation kits for Ball Valves and Tapping ball Valves KBS**  Activating lever system (telescopic) to activate FRIALEN-KHP, KH\*, AKHP and AKHP TL from the street cap.  **Features:**   * may be smoothly adjusted in indicated range (pipe cover H) without tools, even once installed. * self-bearing at each setting. * corrosion protected * design with spanner size 14 especially for domestic service connection range.   **Available in the sizes:**  d 20 - 50 / 0,45 - 0,7 m (SW 30) 1  d 20 - 50 / 0,60 - 1,0 m (SW 30 or SW 14) 1  d 20 - 50 / 1,00 - 1,5 m (SW 30 or SW 14) 1  d 20 - 50 / 1,20 - 2,0 m (SW 30 or SW 14) 1  d 63 - 225 / 0,6 - 1,0 m (SW 30 or SW 14)  d 63 - 225 / 1,0 - 1,5 m (SW 30 or SW 14)  d 63 - 225 / 1,2 - 2,0 m (SW 30 or SW 14)  1 Solid fit of the pipe sleeve socket due to the covered housing design  \* KBS d 63 – d 225 is required for KH d 50 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 17.0  17.1 |  | **Flange T-Piece for the direct connection of hydrant or valves**  **Flange T-Piece TFL**  Area of Application up to 16 bar / 10 bar (water)  **Features:**   * dimension PE 100/ SDR 11 * HD-PE compact component * factory made combination of T-piece, reducer and weld-on flange (see Item 17) * weld-on flange with metal insert to prevent cold flow behaviour (see Item 17) * overlapping measurements designed for standard hydrant. * flange connection measurements to DIN 2501, Part 1 * moulded part with exposed, firmly embedded heating coils for ideal heat transfer during fusion:  1. installation possible without holding device 2. short cooling times  * free passage DN 80 (no internal welding bead!), ensuring optimum suitability for connection to hydrant. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting * acceptance certificate to DIN EN 10 204 - 3.1 on request * DVGW registration to VP 607, GW335 – B2   **Available in the sizes:**  **SDR 11:**  d 110/ DN 80  d 125/ DN 80  d 160/ DN 80  d 180/ DN 80  max. operating pressure 16 bar (water)  **SDR 17:**  d 225/ DN 80  max. operating pressure 10 bar (water) |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 17.2 |  | **90°-Elbow with Base Unit WF 90°**  **Features:**   * HD-PE compact component for the connection of hydrant alongside the mains. * integrated domestic service line spigot d 63/SDR 11 to prevent stagnation. * base unit and elbow as homogenous unit, assembly of base unit possible on foundation. * the elbow with separate fusion zones allows for a simple and stress-free fusion. * exposed heating coils for optimum heat transfer, * great insertion depth, * wide fusion zone * cold zones at the sides and in the centre to prevent the flow of molten material and for processing without holding devices. * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows automatic traceability of the fitting   **Available in the sizes:**  d 90 d 110 |  |  |
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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 17.3 |  | **Flange Reducer** **FLR**  **Features:**   * compact component from HD-PE for fusion of WF 90° elbow with base unit or for valve installation * HD-PE reducer and EFL weld-on flange as homogenous, factory made F-piece * metal insert in flange preventing cold flow * barcoding allows automatic traceability of the fitting * DVGW registration to VP 607 * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Available in the sizes:**  d 110/ DN 80  d 160/ DN100 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 18.0  18.1 |  | **Full Faced Flanges (Spigot Fittings)**  **Full Faced Flanges (Spigot Fittings)** **EFL**  Area of application up to 16 bar (water) or 10 bar (gas)  **Features:**   * HD-PE compact component * weld-on collar and flange as homogenous, factory made F-piece * metal insert in flange preventing cold flow behaviour * PE 100 weld-on side, SDR 11, to be processed with FRIALEN®-couplers (see Item 1) * barcoding allows automatic traceability of the fitting * DVGW registration to VP 607 * acceptance certificate to DIN EN 10 204 - 3.1on request   **Available in the sizes:**  d 63/ DN 50  d 90/ DN 80  d 110/ DN 100  d 125/ DN 100  d 160/ DN 150  d 180/ DN 150  d 225/ DN 200 (PN 10 flange connection) |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 19.0    19.1 |  | **Repair and Reinforcing Saddles**  **Reinforcing Saddles RS**  **Features:**   * HD-PE compact component * manufactured from 2 HD-PE saddles for the repair of minor pipe damage * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * exposed heating coils for optimal heat transfer to the pipe * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Available in the sizes:**  d 63 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 19.2 |  | **Repair and Reinforcing Saddles RSV**  **Features:**   * HD-PE compact component * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * manufactured from one HD-PE repair saddle and one reinforcement saddle for the repair of minor pipe damage * dimension PE 100/ SDR 11 * exposed heating coils for optimal heat transfer to the pipe * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * DVGW registration to VP 607, GW335 – B2 * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Available in the sizes:**  d 90  d 110  d 125  d 160  d 180  d 200  d 225 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 19.3 |  | **Repair Saddles Vacuum-Loading RS VL**  **Features:**   * HD-PE compact component * for the repair of damages such as scratches, grooves or pipe penetration * for large repair area dR 230mm * dimension PE 100/ SDR 17 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * exposed heating coils for optimal heat transfer to the pipe * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * DVGW registration to VP 607, GW335 – B2 * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Assembly advice:**  May be clamped onto pipe before and during fusion using FRIATOOLS- clamping device FRIALOAD.  **Available in the sizes:**  d 500  d 560  d 630  d 710  d 800  d 900  d 1000  d 1200 |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 19.4 |  | **Repair Saddles Top-Loading RS TL**  **Features:**   * HD-PE compact component * suitable for all pipe diameters in the given range d 250 – d 560 * for the repair of minor pipe damages with or without escape of fluid * dimension PE 100/ SDR 11 * **H2 ready 100.** Our products are suitable for use with 100% hydrogen up to MOP 10 bar. Confirmed by test certificate of the DBI - Gastechnisches Institut GmbH * exposed heating coils for optimal heat transfer to the pipe * individually packed in plastic bag * temperature compensation (fusion time is automatically adjusted to ambient temperature) * barcoding allows fully automatic fusion process * barcoding allows automatic traceability of the fitting * safety contacts for secure, touch protected connection of fusion units * fusion indicators for visual proof that fusion has been carried out * permanently stamped batch identification * DVGW registration to VP 607, GW335 – B2 * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Assembly advice:**  May be clamped onto pipe before or during fusion using FRIATOOLS- clamping device FRIATOP (see Item 20).  **Available in the sizes:**  d 250 – d 560 |  |  |

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| 20.0  21.0  22.0  23.0  24.0  25.0 |  | **FRIATOP Clamping Device**  For clamping FRIALEN saddle parts in top loading design in indicated diameter range onto HD-PE pipe before or during fusion.  **VACUSET clamping unit**  For clamping FRIALEN® XL spigot saddles SA-XL and FRIALEN® XL repair saddles RS-XL, for optimum bonding pressure during fusioning to HD-PE pipes.  **UNITOP** **Clamping Device**    For clamping FRIALEN spigot saddles SA UNI in the indicated diameter range d 250 – d 900 onto HD-PE pipes before or during fusion.  **FRIALOAD Clamping Device**    For clamping FRIALEN spigot saddles Vacuum-Loading SA VL and repair saddles Vacuum-Loading RS VL in the indicated diameter range d 400 – d 1200 onto HD-PE pipes before and during fusion.  **FWAB / FWAB ASA** **Drilling device**  For drilling of main HD-PE pipings in unpressurized condition to create a branch or vent. It is driven by a standard drilling machine with a SDS max. hole saw adapter.    **Available in the sizes:**  d 90 d 280  d 110 d 315  d 125 d 355  d 160 d 400  d 225  d 250  **FWDPA SA** **Pressure sample adapter**  For the spigot saddle SA UNI a leak test can take place after the fusion process and before tapping the HD-PE piping |  |  |

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| **Item** | **Qty.** | **Text** | **UP** | **TP** |
| 26.0  26.1 |  | **FIXBLOC** **Fixation for absorbing axial thrust and tensile forces**  **FIXBLOC is used on PE pipes for the creation of fixed point, as a pull-out protection, assembly aid or fixation to pipe bearing.**  **Features:**   * HD-PE compact component * strength per fixed point up to 40 kN * multiple applications possible around the pipe circumference * processing is carried out with standard tensioning belts (belt width 50mm and length approx. 3.5 x pipe (longer for multiple applications)) * if belt cannot be passed around the circumference of the pipe, the clamping device **FIXBLOC FWFB** can be used * exposed heating coils for optimal heat transfer to the pipe * individually packed in plastic bag * permanently stamped batch identification * acceptance certificate to DIN EN 10 204 - 3.1 on request   **Assembly advice:**  Processing with a standard tensioning belt or by using FRIATOOLS® - clamping device **FIXBLOC FWFB** (Order-Ref. 613380)  **Available in the sizes:**  d 160 – 1600  **Clamping device** **FIXBLOC FWFB**  For clamping the FIXBLOC in the indicated diameter range onto HD-PE pipes before and during fusion – if the belt cannot be passed around the pipe. |  |  |

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| 27.0 |  | **Purge stack 1“+ 2“ for venting HD-PE gas pipes GAB 1 + GAB 2**  **Purge stack is used for venting pressurized gas pipes during filling or in operation for use as a measuring point fitting for verification of the odorization content.**  **Features:**  - Purge stack plate of the FRIALEN® Purge stack 1“ (GAB 1) is  available in square design  - Purge stack of the FRIALEN® Purge stack 2“ (GAB 2) is available in diagonal design  - The venting pipe is one meter long as standard and can be adapted to the respective cover height on site  - Longer venting pipes are available on request  - The actuating rods can be infinitely adjusted within the specified range without additional tools  - Easy and safe installation of all components  - Plug with safety vent hole  **Available in the sizes:**  **GAB 1: GAB 2:**  RD 0,7 – 1,0 d 63/1“  RD 0,7 – 1,0 d 63/2“  RD 0,7 – 1,0 d 90/1“  RD 0,7 – 1,0 d 90/2“  RD 0,7 – 1,0 d 110/1“  RD 0,7 – 1,0 d 110/2“  RD 0,7 – 1,0 d 125/1“  RD 0,7 – 1,0 d 125/2“  RD 0,7 – 1,0 d 160/1“  RD 0,7 – 1,0 d 160/2“  RD 0,7 – 1,0 d 180/1“  RD 0,7 – 1,0 d 180/2“  RD 0,7 – 1,0 d 225/1“  RD 0,7 – 1,0 d 225/2“ |  |  |