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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 (PE80, PE100, PE-Xa) for operating pressures up to 25 bar (water) and 10 bar (gas).

FRIATEC GmbH Mannheim, Technical Plastics Division, Tel.: +49 621 486 1572.

Item	No.	Text	Price each	Total
1.0		Electrofusion couplers for longitudinally strong connections of HD-PE pipes		
1.1		<p>MB/UB/UB XL Couplers with or without removable stop</p> <p><u>Features:</u></p> <ul style="list-style-type: none"> - dimensions PE 100/ SDR 11 / SDR 17 - 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: <ul style="list-style-type: none"> ⇒ 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 		

Item	No.	Text	Price each	Total																											
		<p><u>Available in dimensions:</u></p> <ul style="list-style-type: none"> • PE 100 / SDR 11 <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">d 20</td> <td style="width: 33%;">d 125</td> <td style="width: 33%;">d 355</td> </tr> <tr> <td>d 25</td> <td>d 140</td> <td>d 400¹</td> </tr> <tr> <td>d 32</td> <td>d 160</td> <td>d 450¹</td> </tr> <tr> <td>d 40</td> <td>d 180</td> <td>d 500¹</td> </tr> <tr> <td>d 50</td> <td>d 200</td> <td>d 560¹</td> </tr> <tr> <td>d 63</td> <td>d 225</td> <td>d 630¹</td> </tr> <tr> <td>d 75</td> <td>d 250</td> <td>d 710¹</td> </tr> <tr> <td>d 90</td> <td>d 280</td> <td>d 800¹</td> </tr> <tr> <td>d 110</td> <td>d 315</td> <td></td> </tr> </table> <ul style="list-style-type: none"> • PE 100 / SDR 17 <p>d 560^{1,2} d 630^{1,2} d 710^{1,2} d 800^{1,2,3} d 900^{1,2,3} d 1000^{1,2,4} d 1200^{1,2,4}</p> <p>¹ separate fusion zones ² authorised operating pressures 10 bar (water) 5 bar (gas) ³ Note: FRIALEN® Info No. 42 ⁴ Use FRIAMAT-XL electrofusion unit (high-voltage current), FWSG-XL scraper tool ⁵ Other dimensions or pressure ratings available upon request</p>	d 20	d 125	d 355	d 25	d 140	d 400 ¹	d 32	d 160	d 450 ¹	d 40	d 180	d 500 ¹	d 50	d 200	d 560 ¹	d 63	d 225	d 630 ¹	d 75	d 250	d 710 ¹	d 90	d 280	d 800 ¹	d 110	d 315			
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d 25	d 140	d 400 ¹																													
d 32	d 160	d 450 ¹																													
d 40	d 180	d 500 ¹																													
d 50	d 200	d 560 ¹																													
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d 75	d 250	d 710 ¹																													
d 90	d 280	d 800 ¹																													
d 110	d 315																														

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1.2		<p>Couplers without removable stop UB PN25 for a maximum operating pressure of 25 bar (water)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> ⇒ 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 <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">d 90</td> <td style="width: 50%;">d 315¹</td> </tr> <tr> <td>d 110</td> <td>d 355¹</td> </tr> <tr> <td>d 125</td> <td></td> </tr> <tr> <td>d 140</td> <td></td> </tr> <tr> <td>d 160</td> <td></td> </tr> <tr> <td>d 180</td> <td></td> </tr> <tr> <td>d 200</td> <td></td> </tr> <tr> <td>d 225</td> <td></td> </tr> <tr> <td>d 250</td> <td></td> </tr> </table> <p>¹ separate fusion zones</p>	d 90	d 315 ¹	d 110	d 355 ¹	d 125		d 140		d 160		d 180		d 200		d 225		d 250			
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d 140																						
d 160																						
d 180																						
d 200																						
d 225																						
d 250																						

Item	No.	Text	Price each	Total
1.3		<p>Couplers without removable stop UB SDR 9 for a maximum operating pressure of 20 bar (water)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 <p>Available in dimensions:</p> <ul style="list-style-type: none"> d 400¹ d 450¹ d 500¹ d 560¹ d 630¹ <p>¹ separate fusion zones</p>		

Item	No.	Text	Price each	Total
1.4		<p>Conical ring coupler KM XL Electrofusion-Coupler for minimisation of the joint gap thanks to flex ring system and with integrated assembling aid. For a maximum operating pressure of 10 bar (water) / 4 bar (gas)</p> <p><u>Features:</u></p> <ul style="list-style-type: none"> - dimensions PE 100/ SDR 17 - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 <p><u>Available in dimensions:</u></p> <ul style="list-style-type: none"> d 355 d 400 d 450 d 560 d 630 d 800 d 1000 d 1200 		

Item	No.	Text	Price each	Total
1.5		<p>Long couplers: FRIALONG with pipe alignment function due to extra-long design especially designed for fusion of coiled pipes low in tension.</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - both sides of the pipe can be fused simultaneously - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 <p>Available in dimensions:</p> <ul style="list-style-type: none"> d 32 d 40 d 50 d 63 		

Item	No.	Text	Price each	Total
1.6		<p>FRIALONG long coupler with integrated excess flow valve (Sentry GS®):</p> <p>FRIASTOPP, System Mertik Maxitrol (Gas)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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. <p>FRIALONG electrofusion coupler</p> <ul style="list-style-type: none"> - 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 <p>Additional features:</p> <ul style="list-style-type: none"> - dimensions PE 100/SDR 11 - both sides of the pipe can be fused simultaneously - exposed, firmly embedded heating coils, without PE coating, for the ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 <p>Available in 3 designs:</p> <p>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</p> <p>Available in dimensions:</p> <p>d 32 d 40 d 50 d 63</p>		

Item	No.	Text	Price each	Total
1.7		<p>FRIALONG long coupler with integrated gas stop®:</p> <p>FRIASTOPP, System Pipelife (Gas)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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. <p>FRIALONG electrofusion coupler</p> <ul style="list-style-type: none"> - 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 <p>Additional features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - both sides of the pipe can be fused simultaneously - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 		

Item	No.	Text	Price each	Total
		<p><u>Available in 4 designs:</u> 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 U: for power pressure 35 mbar - 5 bar, without bypass opening Type U_{UE}: for power pressure 35 mbar - 5 bar, with bypass opening</p> <p><u>Available in dimensions:</u> d 32 d 50 d 63</p>		

Item	No.	Text	Price each	Total
1.8		<p>MR reducer with integrated excess flow valve (Sentry GS®):</p> <p>MR-STOPP, Mertik Maxitrol (Gas) System</p> <p>Features:</p> <ul style="list-style-type: none"> - 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. <p>Electrofusion reducer MR</p> <ul style="list-style-type: none"> - 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 <p>Additional features:</p> <ul style="list-style-type: none"> - dimensions PE 100/ SDR 11 - both sides of the pipe can be fused simultaneously - exposed, firmly embedded heat transmitter, without PE coating, for optimum heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 		

Item	No.	Text	Price each	Total
		<p><u>Available in 2 designs:</u> Type D: for power pressure 25 mbar - 1 bar, with bypass opening Type Z: for power pressure 35 mbar - 5 bar, with bypass opening</p> <p><u>Available in dimensions:</u> 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</p> <p>[bold]: Dimension of excess flow valve, flow direction: d LARGE ⇒ d small</p>		

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2.0		MV end caps																
2.1		<p>With integrated heating coils</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - compact component made from HD-PE - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">d 20</td> <td style="width: 50%;">d 90</td> </tr> <tr> <td>d 25</td> <td>d 110</td> </tr> <tr> <td>d 32</td> <td>d 125</td> </tr> <tr> <td>d 40*</td> <td>d 160</td> </tr> <tr> <td>d 50</td> <td>d 180</td> </tr> <tr> <td>d 63</td> <td>d 200</td> </tr> <tr> <td>d 75</td> <td>d 225</td> </tr> </table> <p>* Also recommended as fused caps for the dome of FRIALEN-Pressure Tapping Tees DAA/DAP ≤ d63.</p>	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		
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3.0		<p>MR Reducers</p> <p>With integrated heating coils</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - both sides of the pipe can be fused simultaneously - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ installation possible without holding device ⇒ short cooling times - couplers with easily removable centre stop - insertion depth to maximum ISO requirement - extra-wide fusion zones - extra-long zones at the sides and in the centre to improve pipe guidance and prevent flow of molten - 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 <p>Available in dimensions:</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%;"><u>d 20 / 16</u></td> <td style="width: 33%;"><u>d 50 / 32</u></td> <td style="width: 33%;"><u>d 90 / 75</u></td> </tr> <tr> <td><u>d 32 / 16</u></td> <td><u>d 50 / 40</u></td> <td><u>d 110 / 63</u></td> </tr> <tr> <td><u>d 32 / 20</u></td> <td><u>d 63 / 32</u></td> <td><u>d 110 / 90</u></td> </tr> <tr> <td><u>d 32 / 25</u></td> <td><u>d 63 / 40</u></td> <td><u>d 125 / 90</u></td> </tr> <tr> <td><u>d 40 / 20</u></td> <td><u>d 63 / 50</u></td> <td><u>d 125 / 110</u></td> </tr> <tr> <td><u>d 40 / 25</u></td> <td><u>d 75 / 63</u></td> <td><u>d 160 / 110</u></td> </tr> <tr> <td><u>d 40 / 32</u></td> <td><u>d 90 / 50</u></td> <td><u>d 180 / 125</u></td> </tr> <tr> <td><u>d 50 / 20</u></td> <td><u>d 90 / 63</u></td> <td><u>d 225 / 160</u></td> </tr> <tr> <td><u>d 50 / 25</u></td> <td></td> <td></td> </tr> </table>	<u>d 20 / 16</u>	<u>d 50 / 32</u>	<u>d 90 / 75</u>	<u>d 32 / 16</u>	<u>d 50 / 40</u>	<u>d 110 / 63</u>	<u>d 32 / 20</u>	<u>d 63 / 32</u>	<u>d 110 / 90</u>	<u>d 32 / 25</u>	<u>d 63 / 40</u>	<u>d 125 / 90</u>	<u>d 40 / 20</u>	<u>d 63 / 50</u>	<u>d 125 / 110</u>	<u>d 40 / 25</u>	<u>d 75 / 63</u>	<u>d 160 / 110</u>	<u>d 40 / 32</u>	<u>d 90 / 50</u>	<u>d 180 / 125</u>	<u>d 50 / 20</u>	<u>d 90 / 63</u>	<u>d 225 / 160</u>	<u>d 50 / 25</u>				
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Item	No.	Text	Price each	Total																		
4.0		W Elbows																				
4.1		<p>With integrated heating coils</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - both sides of the pipe can be fused simultaneously - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 																				
4.11		<p>45° and 90° elbows</p> <p>Available in dimensions:</p> <p>d 20 (only W90°)</p> <p>d 25</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">d 32</td> <td style="width: 33%;">d 110</td> <td style="width: 33%;">d 250¹</td> </tr> <tr> <td>d 40</td> <td>d 125</td> <td>d 280¹</td> </tr> <tr> <td>d 50</td> <td>d 160</td> <td>d 315¹</td> </tr> <tr> <td>d 63</td> <td>d 180</td> <td></td> </tr> <tr> <td>d 75</td> <td>d 200</td> <td></td> </tr> <tr> <td>d 90</td> <td>d 225</td> <td></td> </tr> </table> <p>¹ separate fusion zones</p>	d 32	d 110	d 250 ¹	d 40	d 125	d 280 ¹	d 50	d 160	d 315 ¹	d 63	d 180		d 75	d 200		d 90	d 225			
d 32	d 110	d 250 ¹																				
d 40	d 125	d 280 ¹																				
d 50	d 160	d 315 ¹																				
d 63	d 180																					
d 75	d 200																					
d 90	d 225																					
4.12		<p>30° elbows</p> <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">d 90</td> <td style="width: 50%;">d 180</td> </tr> <tr> <td>d 110</td> <td>d 200</td> </tr> <tr> <td>d 125</td> <td>d 225</td> </tr> <tr> <td>d 160</td> <td></td> </tr> </table>	d 90	d 180	d 110	d 200	d 125	d 225	d 160													
d 90	d 180																					
d 110	d 200																					
d 125	d 225																					
d 160																						

Item	No.	Text	Price each	Total
5.0		I/A 11° Elbows WS11°		
5.1		<p>With integrated heating coils</p> <p>Features:</p> <ul style="list-style-type: none"> - I/A design: coupler / spigot - universal change of direction due to multiple application 11°/22°/33° or 45° + 11° ... - dimension PE 100/ SDR 11 - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 <p>Available in dimensions:</p> <ul style="list-style-type: none"> d 110 d 125 d 160 d 180 d 225 		

Item	No.	Text	Price each	Total
6.0		WET Swan neck bend		
6.1		<p>With integrated heating coils</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - exposed, firmly embedded, heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 <p>Available in dimensions:</p> <p>d 32 d 40 d 50 d 63¹</p> <p>¹elbows execution in version 2 x W90°</p>		

Item	No.	Text	Price each	Total						
7.0		90° T Pieces T								
7.1		<p>With integrated heating coils</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 								
7.11		<p>90° T Pieces monofilar TA</p> <p>One fusion process for the simultaneous connection of both sides of the pipe in passage, with spigot outlet and loosely attached coupler for the fusion of spigot outlet.</p> <p>Available in dimensions:</p> <table style="margin-left: 20px; border: none;"> <tr> <td>d 20 / 20</td> <td>d 40 / 40</td> </tr> <tr> <td>d 25 / 25</td> <td>d 50 / 50</td> </tr> <tr> <td>d 32 / 32</td> <td>d 63 / 63</td> </tr> </table>	d 20 / 20	d 40 / 40	d 25 / 25	d 50 / 50	d 32 / 32	d 63 / 63		
d 20 / 20	d 40 / 40									
d 25 / 25	d 50 / 50									
d 32 / 32	d 63 / 63									

Item	No.	Text	Price each	Total												
7.12		<p>90° T Piece with triangular electrofusion</p> <p>One fusion process for the simultaneous connection of both sides of the pipe in passage, separate fusion process to integrate branch.</p> <p><u>Available in dimensions:</u></p> <table data-bbox="437 528 858 645"> <tr> <td>d 75</td> <td>d 160</td> <td>d 250¹</td> </tr> <tr> <td>d 90</td> <td>d 180</td> <td>d 280¹</td> </tr> <tr> <td>d 110</td> <td>d 200</td> <td>d 315¹</td> </tr> <tr> <td>d 125</td> <td>d 225</td> <td></td> </tr> </table> <p>¹ Separate fusion process per connection</p>	d 75	d 160	d 250 ¹	d 90	d 180	d 280 ¹	d 110	d 200	d 315 ¹	d 125	d 225			
d 75	d 160	d 250 ¹														
d 90	d 180	d 280 ¹														
d 110	d 200	d 315 ¹														
d 125	d 225															
7.13		<p>90° T-Piece reduced, Tred with electrofusion couplers in the passage and outlet pipe spigots</p> <p>Separate fusion process per connection in the passage, outlet with SDR11 pipe spigot</p> <p>Other outlet dimensions can be created with MR reducers, e.g. FRIALEN MR d 225 / d 160</p> <p><u>Available in dimensions:</u></p> <p>d 250 / d 225 d 280 / d 225 d 315 / d 225</p>														

Item	No.	Text	Price each	Total
8.0		<p>FRIALEN® - Y and YS Section Heating Coils</p> <p>Y (pipe joint / Y section)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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) <p>Available in dimensions:</p> <p>Y d32-d32-d40 (art. no. 640034)</p> <p>Y d40-d40-d50 (art. no. 640036)</p>		

Item	No.	Text	Price each	Total
		<p>YS (pipe joint / YS section)</p> <p><u>Features:</u></p> <ul style="list-style-type: none"> - 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 fusing 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) <p><u>Available in dimensions:</u></p> <p>YS d32-d32-d40 (art. no. 640035; d40 = pipe spigot) YS d40-d40-d50 (art. no. 640037; d50 = pipe spigot)</p>		

Item	No.	Text	Price each	Total												
9.0		HD-PE / Steel Adapters for gas pipes USTR/USTN/USTM														
9.1		With integrated heating coils <u>Features:</u> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 														
9.11		USTR: with fusion end for steel pipes Steel pipe spigots with markings by restamping for gas networks ≤ 10 bar operating pressure <u>Available in dimensions:</u> <table style="margin-left: 40px; border: none;"> <tr> <td>d 32/ DN 25</td> <td>d 110/ DN 100</td> </tr> <tr> <td>d 40/ DN 32</td> <td>d 125/ DN 100</td> </tr> <tr> <td>d 50/ DN 40</td> <td>d 160/ DN 150</td> </tr> <tr> <td>d 63/ DN 50</td> <td>d 180/ DN 150</td> </tr> <tr> <td>d 75/ DN 65</td> <td>d 200/ DN 200</td> </tr> <tr> <td>d 90/ DN 80</td> <td>d 225/ DN 200</td> </tr> </table>	d 32/ DN 25	d 110/ DN 100	d 40/ DN 32	d 125/ DN 100	d 50/ DN 40	d 160/ DN 150	d 63/ DN 50	d 180/ DN 150	d 75/ DN 65	d 200/ DN 200	d 90/ DN 80	d 225/ DN 200		
d 32/ DN 25	d 110/ DN 100															
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d 90/ DN 80	d 225/ DN 200															

Item	No.	Text	Price each	Total
9.12		<p>With external thread (according to DIN 2999)</p> <p>USTN: <u>straight design</u> d/ R 32/ 1" d/ R 40/ 1¼" d/ R 50/ 1½" d/ R 63/ 2"</p>		
9.13		<p>With internal thread (according to DIN 2999)</p> <p>USTM: <u>straight design</u> d/ Rp 32/ 1" d/ Rp 40/ 1¼" d/ Rp 50/ 1½" d/ Rp 63/ 2"</p>		

Item	No.	Text	Price each	Total																						
9.2		<p>USTRS Transition Fittings HD-PE / Steel</p> <p>Spigot Fittings</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 																								
9.21		<p>USTRS: fusion end for steel pipes</p> <p>Steel pipe spigots with markings by restamping for gas networks ≤ 10 bar operating pressure</p> <p>Available in dimensions:</p> <table border="0"> <tr> <td>d 20/ DN 15</td> <td>d 160/ DN 150</td> </tr> <tr> <td>d 25/ DN 20</td> <td>d 180/ DN 150</td> </tr> <tr> <td>d 32/ DN 25</td> <td>d 200/ DN 200</td> </tr> <tr> <td>d 40/ DN 32</td> <td>d 225/ DN 200</td> </tr> <tr> <td>d 50/ DN 40</td> <td>d 250/ DN 250</td> </tr> <tr> <td>d 63/ DN 50</td> <td>d 280/ DN 250</td> </tr> <tr> <td>d 75/ DN 65</td> <td>d 315/ DN 300</td> </tr> <tr> <td>d 90/ DN 80</td> <td>d 355/ DN 300</td> </tr> <tr> <td>d 110/ DN 100</td> <td>d 400/ DN 400</td> </tr> <tr> <td>d 125/ DN 100</td> <td>d 500/ DN 500</td> </tr> <tr> <td>d 140/ DN 125</td> <td>d 630/ DN 600</td> </tr> </table>	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		
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																									
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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																									

Item	No.	Text	Price each	Total
10.0		<p>Transition Fittings HD-PE / brass or gunmetal for gas – water pipes MUN, MUM, WUN45°, WUN90°, UAN, UAM</p>		
10.1		<p>With integrated heating coils</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 		

Item	No.	Text	Price each	Total
10.11		<p>With external thread (brass)</p> <p><u>Available in dimensions:</u> <u>straight design MUN</u></p> <p>d/ R 32/ 1" d/ R 32/ 1¼" d/ R 32/ 1½" d/ R 40/ 1" d/ R 40/ 1¼" d/ R 40/ 1½" d/ R 40/ 2" d/ R 50/ 1" d/ R 50/ 1¼" d/ R 50/ 1½" d/ R 50/ 2" d/ R 63/ 1¼" d/ R 63/ 1½" d/ R 63/ 2" d/ R 75/ 2" d/ R 75/ 2½"</p> <p><u>90°WUN90° elbow</u></p> <p>d/ R 32/ 1" d/ R 32/ 1½" d/ R 40/ 1" d/ R 40/ 1¼" d/ R 40/ 1½" d/ R 50/ 1" d/ R 50/ 1¼" d/ R 50/ 1½" d/ R 63/ 1½" d/ R 63/ 2"</p>		
10.12		<p>With internal thread (gunmetal)</p> <p><u>Available in dimensions:</u> <u>straight design MUM</u></p> <p>d/ Rp 32/ 1" d/ Rp 40/ 1¼" d/ Rp 50/ 1½" d/ Rp 63/ 1½" d/ Rp 63/ 2"</p>		

Item	No.	Text	Price each	Total												
10.2		<p>Universal adapter with HD-PE side as pipe spigot</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 														
10.21		<p>With external thread (brass) UAN</p> <p>Available in dimensions:</p> <table data-bbox="405 801 831 981"> <tr> <td>d/ R 20/ ½"</td> <td>d/ R 63/ 2"</td> </tr> <tr> <td>d/ R 25/ ¾"</td> <td>d/ R 75/ 2½"</td> </tr> <tr> <td>d/ R 32/ 1"</td> <td>d/ R 90/ 3"</td> </tr> <tr> <td>d/ R 40/ 1¼"</td> <td>d/ R 110/ 4"</td> </tr> <tr> <td>d/ R 50/ 1½"</td> <td>d/ R 125/ 4"</td> </tr> <tr> <td>d/ R 63/ 1½"</td> <td></td> </tr> </table>	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"			
d/ R 20/ ½"	d/ R 63/ 2"															
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d/ R 50/ 1½"	d/ R 125/ 4"															
d/ R 63/ 1½"																
10.22		<p>With internal thread (brass) UAM</p> <p>Available in dimensions:</p> <table data-bbox="405 1144 863 1323"> <tr> <td>d/ Rp 20/ ½"</td> <td>d/ Rp 63/ 2"</td> </tr> <tr> <td>d/ Rp 25/ ¾"</td> <td>d/ Rp 75/ 2½"</td> </tr> <tr> <td>d/ Rp 32/ 1"</td> <td>d/ Rp 90/ 3"</td> </tr> <tr> <td>d/ Rp 40/ 1¼"</td> <td>d/ Rp 110/ 4"</td> </tr> <tr> <td>d/ Rp 50/ 1½"</td> <td>d/ Rp 125/ 4"</td> </tr> <tr> <td>d/ Rp 63/ 1½"</td> <td></td> </tr> </table>	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"			
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"																

Item	No.	Text	Price each	Total
10.3		<p>Transition Fittings for liquid gas HD-PE / copper UFLG</p> <p>Compact component as material adapter in connection area of liquid gas supply utilities for the operation of consumption plants out of the gas phase.</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - exposed, firmly embedded heating coils, without PE coating, for ideal heat transfer during fusion: <ul style="list-style-type: none"> ⇒ 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 <p>Available in dimension: d 32/ DN 20</p>		

Item	No.	Text	Price each	Total
11.0		Tapping Tees		
11.1		<p>DAA Pressure Tapping Tees with fast clamping lever and with integrated drill Area of application up to 16 bar (water) or 10 bar (gas)</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension SDR 11/ PE 100 - 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: <ul style="list-style-type: none"> * 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 		

		<u>Available in dimensions: (* supplied in kit version with reducer MR d63/40 or MR d63/50 included)</u>		
		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	No.	Text	Price each	Total												
11.2		<p>DAA TL Pressure Tapping Tees Top-Loading</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 8.1. <p>Areas of Application:</p> <p>d 250 – d 315: Tapping pipe SDR 17.6 – SDR 11 d 355 – d 400: Tapping pipe SDR 17.6/ 17</p> <p>Assembly advice:</p> <ul style="list-style-type: none"> - Clamping onto pipe takes place before or during fusion using FRIALEN® clamping device FRIATOP (see Item 15). 														
11.3		<p>DAP Pressure Tapping Tee with parallel dome for space saving horizontal installation</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 8.1 <p>Available in dimensions:</p> <table data-bbox="411 1579 973 1702"> <tr> <td>d 63/32</td> <td>d 125/32</td> <td>d 180/32</td> </tr> <tr> <td>d 90/32*</td> <td>d 125/50</td> <td>d 180/50</td> </tr> <tr> <td>d 110/32</td> <td>d 160/32</td> <td>d 225/32</td> </tr> <tr> <td>d 110/50</td> <td>d 160/50</td> <td>d 225/50</td> </tr> </table> <p>* max. operating pressure: gas 5bar, water 10bar</p>	d 63/32	d 125/32	d 180/32	d 90/32*	d 125/50	d 180/50	d 110/32	d 160/32	d 225/32	d 110/50	d 160/50	d 225/50		
d 63/32	d 125/32	d 180/32														
d 90/32*	d 125/50	d 180/50														
d 110/32	d 160/32	d 225/32														
d 110/50	d 160/50	d 225/50														

Item	No.	Text	Price each	Total
11.4		<p>Cap for Pressure Tapping Tees K Electrofusion-Cap K for final sealing of the drill socket (dome) of a Pressure Tapping Tee DAA \geq d 90 or SPA d 63. Also suitable as a sealing cap for d 50 pipes.</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 - durable batch marking - individually wrapped for dirt protection <p>Available in dimensions: d 50</p>		

Item	No.	Text	Price each	Total																																
12.0		Pressure Tapping Valves																																		
12.1		<p>DAV Pressure Tapping Valves with integrated drill Area of application up to 16 bar (water) or 10 bar (gas)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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) <p>Available in dimensions:</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <tr> <td>d 50/32</td> <td>d 110/32</td> <td>d 140/63</td> <td>d 180/63</td> </tr> <tr> <td>d 63/32</td> <td>d 110/40*</td> <td>d 160/32</td> <td>d 200/32</td> </tr> <tr> <td>d 63/40</td> <td>d 110/50</td> <td>d 160/40*</td> <td>d 200/50</td> </tr> <tr> <td>d 75/32</td> <td>d 110/63</td> <td>d 160/50</td> <td>d 200/63</td> </tr> <tr> <td>d 90/32</td> <td>d 125/32</td> <td>d 160/63</td> <td>d 225/32</td> </tr> <tr> <td>d 90/40*</td> <td>d 125/40*</td> <td>d 180/32</td> <td>d 225/40*</td> </tr> <tr> <td>d 90/50</td> <td>d 125/50</td> <td>d 180/40*</td> <td>d 225/50</td> </tr> <tr> <td>d 90/63</td> <td>d 125/63</td> <td>d 180/50</td> <td>d 225/63</td> </tr> </table> <p>* = supplied in kit version including reducer coupler</p>	d 50/32	d 110/32	d 140/63	d 180/63	d 63/32	d 110/40*	d 160/32	d 200/32	d 63/40	d 110/50	d 160/40*	d 200/50	d 75/32	d 110/63	d 160/50	d 200/63	d 90/32	d 125/32	d 160/63	d 225/32	d 90/40*	d 125/40*	d 180/32	d 225/40*	d 90/50	d 125/50	d 180/40*	d 225/50	d 90/63	d 125/63	d 180/50	d 225/63		
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Item	No.	Text	Price each	Total						
12.11		<p>DAV TL Pressure Tapping Valves Top-Loading</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 9.1 <p>Available for pipes SDR 17.6 – SDR 11 in dimensions: d 250 – d 315 d 355 – d 400</p> <p>Assembly advice: May be clamped onto pipe before or during fusion using FRIALEN®-FRIATOP clamping device</p>								
12.2		<p>Installation kits for EBS Pressure Tapping Valves</p> <p>Features:</p> <ul style="list-style-type: none"> - activating lever system (telescopic) to activate FRIALEN®-DAV from the street cap. - adjustable in indicated range (pipe cover H), even once installed, no tools required. - Self-bearing at every setting. - corrosion protected <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">0.45 – 0.7 m</td> <td style="width: 50%;">1.2 – 1.8 m</td> </tr> <tr> <td>0.7 – 1.0 m</td> <td>1.8 – 2.7 m</td> </tr> <tr> <td>0.9 – 1.3 m</td> <td>2.6 – 3.5 m</td> </tr> </table>	0.45 – 0.7 m	1.2 – 1.8 m	0.7 – 1.0 m	1.8 – 2.7 m	0.9 – 1.3 m	2.6 – 3.5 m		
0.45 – 0.7 m	1.2 – 1.8 m									
0.7 – 1.0 m	1.8 – 2.7 m									
0.9 – 1.3 m	2.6 – 3.5 m									

Item	No.	Text	Price each	Total								
13.0		Shut-off Saddles										
13.1		<p>SPA Shut-off Saddles Including brass plugs with integrated square and throw-on screw cap</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - 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 FRIALEN[®] cap for shut-off valves d 90 - d 225 - acceptance certificate to DIN EN 10 204 - 3.1 B on request - DVGW registration to VP 607 <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">d/ R d 63/ 1½"*</td> <td style="width: 50%;">d/ R d 160/ 2½"</td> </tr> <tr> <td>d/ R d 90/ 2½"</td> <td>d/ R d 180/ 2½"</td> </tr> <tr> <td>d/ R d 110/ 2½"</td> <td>d/ R d 200/ 2½"</td> </tr> <tr> <td>d/ R d 125/ 2½"</td> <td>d/ R d 225/ 2½"</td> </tr> </table> <p>* different construction</p>	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"		
d/ R d 63/ 1½"*	d/ R d 160/ 2½"											
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d/ R d 110/ 2½"	d/ R d 200/ 2½"											
d/ R d 125/ 2½"	d/ R d 225/ 2½"											
13.2		<p>SPA TL Top-Loading Shut-off Saddles including brass plugs with integrated square and throw-on HD-PE screw cap</p> <p>Features:</p> <ul style="list-style-type: none"> - 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. <p>Available in dimensions: d 250 - d 315 (560)/ R 2½" (may be fused up to d 560, please observe advice by shut-off saddle manufacturer)</p> <p>Assembly advice:</p> <ul style="list-style-type: none"> - clamping to pipe should take place before or during fusion using FRIALEN[®] FRIATOP clamping device (see Item 21). 										

Item	No.	Text	Price each	Total
13.3		<p>Cap for Shut-off Saddles SPAK Electrofusion-Cap SPAK for final sealing of the drill socket (dome) of a Shut off Saddle SPA \geq d90 or SPA TL. Also suitable as End Cap MV for d 75.</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 <p>Available in dimensions: d 75</p>		

Item	No.	Text	Price each	Total																												
14.0		Spigot Saddles																														
14.1		<p>SA Spigot Saddles For retrospective tapping of PE pipes using a separate tapping tool.</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - 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 <p>Available in dimensions:</p> <table border="1" data-bbox="408 1099 1254 1323"> <tbody> <tr> <td>d 63/ 32</td> <td>d 110/ 63</td> <td>d 160/ 63</td> <td>d 180/ 125</td> </tr> <tr> <td>d 63/ 50</td> <td>d 110/ 90</td> <td>d 160/ 90</td> <td>d 200/ 63</td> </tr> <tr> <td>d 75/ 50</td> <td>d 125/ 32</td> <td>d 160/ 110</td> <td>d 225/ 63</td> </tr> <tr> <td>d 90/ 32</td> <td>d 125/ 63</td> <td>d 160/ 125</td> <td>d 225/ 90</td> </tr> <tr> <td>d 90/ 63</td> <td>d 125/ 90</td> <td>d 180/ 63</td> <td>d 225/ 110</td> </tr> <tr> <td>d 110/ 32</td> <td>d 125/ 110</td> <td>d 180/ 90</td> <td>d 225/ 125</td> </tr> <tr> <td>d 110/ 50</td> <td>d 160/ 32</td> <td>d 180/ 110</td> <td>d 225/ 160</td> </tr> </tbody> </table>	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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d 110/ 50	d 160/ 32	d 180/ 110	d 225/ 160																													

Item	No.	Text	Price each	Total
14.2		<p>SA TL Spigot Saddles Top-Loading for the retrospective tapping of PE pipes in pressure free condition using FRIALEN[®] tapping tool (see Item 21)</p> <p>Features: - flexible adaptation to all pipe diameters in indicated range of dimensions using FRIATOP clamping device (see Item 21). - for additional features see Item 13.1</p> <p>Available in dimensions: d 250 - 560/ 32 d 250 - 560/ 63</p> <p>Other outlet sizes may be created with reducer couplers (Item 3)</p> <p>Assembly advice: - clamping onto pipe takes place before or during fusion using FRIALEN[®] FRIATOP clamping device (see Item 21).</p>		

Item	No.	Text	Price each	Total										
14.3		<p>SA FL Spigot Saddles with Flange Outlet</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 13.1 and 17.0 <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">d 110/ DN 80</td> <td style="width: 50%;">d 160/ DN 100</td> </tr> <tr> <td>d 125/ DN 80</td> <td>d 225/ DN 100</td> </tr> <tr> <td>d 160/ DN 80</td> <td></td> </tr> <tr> <td>d 180/ DN 80</td> <td></td> </tr> <tr> <td>d 225/ DN 80</td> <td></td> </tr> </table>	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			
d 110/ DN 80	d 160/ DN 100													
d 125/ DN 80	d 225/ DN 100													
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d 225/ DN 80														
14.4		<p>SA XL Spigot Saddles</p> <p>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 VACUSET clamping tool. Pipes are tapped using the FRIATOOLS FWAB XL tapping set for pressure-free piping.</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/SDR 11 or SDR 17 - 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 												

Item	No.	Text	Price each	Total																																																					
		<p><u>Available in dimensions:</u></p> <ul style="list-style-type: none"> • SDR 11 <table border="0"> <tr> <td>d 400/ d 225</td> <td>d 630/ d 315</td> <td>d 900/ d 280</td> </tr> <tr> <td>d 400/ d 250</td> <td>d 630/ d 355</td> <td>d 900/ d 315</td> </tr> <tr> <td>d 450/ d 225</td> <td>d 630/ d 400</td> <td>d 900/ d 355</td> </tr> <tr> <td>d 450/ d 250</td> <td>d 710/ d 225</td> <td>d 900/ d 400</td> </tr> <tr> <td>d 500/ d 225</td> <td>d 710/ d 250</td> <td>d 1000/ d 225</td> </tr> <tr> <td>d 500/ d 250</td> <td>d 710/ d 280</td> <td>d 1000/ d 250</td> </tr> <tr> <td>d 500/ d 280</td> <td>d 710/ d 315</td> <td>d 1000/ d 280</td> </tr> <tr> <td>d 500/ d 315</td> <td>d 710/ d 355</td> <td>d 1000/ d 315</td> </tr> <tr> <td>d 560/ d 225</td> <td>d 710/ d 400</td> <td>d 1000/ d 355</td> </tr> <tr> <td>d 560/ d 250</td> <td>d 800/ d 225</td> <td>d 1000/ d 400</td> </tr> <tr> <td>d 560/ d 280</td> <td>d 800/ d 250</td> <td>d 1200/ d 225</td> </tr> <tr> <td>d 560/ d 315</td> <td>d 800/ d 280</td> <td>d 1200/ d 250</td> </tr> <tr> <td>d 560/ d 355</td> <td>d 800/ d 315</td> <td>d 1200/ d 280</td> </tr> <tr> <td>d 560/ d 400</td> <td>d 800/ d 355</td> <td>d 1200/ d 315</td> </tr> <tr> <td>d 630/ d 225</td> <td>d 800/ d 400</td> <td>d 1200/ d 355</td> </tr> <tr> <td>d 630/ d 250</td> <td>d 900/ d 225</td> <td>d 1200/ d 400</td> </tr> <tr> <td>d 630/ d 280</td> <td>d 900/ d 250</td> <td></td> </tr> </table> <ul style="list-style-type: none"> • SDR 17 <table border="0"> <tr> <td>d 1000/ d 160</td> </tr> <tr> <td>d 1200/ d 160</td> </tr> </table>	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		d 1000/ d 160	d 1200/ d 160		
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Item	No.	Text	Price each	Total
14.5		<p>Spigot Saddles SA UNI</p> <p>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 800. 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 XL for pressure-free piping (see Item 22).</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100 / SDR 11 - 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 800 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 <p>Available in dimensions:</p> <ul style="list-style-type: none"> 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 		

Item	No.	Text	Price each	Total
15.0		PE Shut-off valves		
15.1		<p>FRIALOC® PE Shut-off Valves for water service pipes compliant with DIN EN 805 and DVGW W400 “Flap valve” system</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 - KTW certificates and W270 approval available - DVGW registration to DVGW W364 		

Item	No.	Text	Price each	Total
15.2		<p><u>Available in dimensions:</u> d 90 d 110 d 125 d 160 d 180 d 200* d 225* d 250*</p> <p>* limited passage corresponds to dim. d 180 FRIALOC dim. d 200 and d 250 on request</p> <p>Installation kits for FRIALOC® FBS Telescopic lever for operating FRIALOC® PE Shut-off Valve from duct cover.</p> <p><u>Features:</u></p> <ul style="list-style-type: none"> - 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 (SW) 30 <p><u>Available in dimensions:</u> 0.75 – 1.0 m 0.9 – 1.3 m 1.2 - 1.8 m 1.5 - 2.3 m 2.4 – 3.5 m*</p> <p>* deliverable only in stainless steel</p>		

Item	No.	Text	Price each	Total													
16.0		Ball Valves															
16.1		<p>KHP Ball Valve Area of application up to 10 bar (gas)</p> <p>Features:</p> <ul style="list-style-type: none"> - dimension PE 100/ SDR 11 - 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) <p>Double spigot length for double fusion</p> <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">d 32</td> <td style="width: 33%;">d 63</td> <td style="width: 33%;">d 125</td> </tr> <tr> <td>d 40</td> <td>d 90</td> <td></td> </tr> <tr> <td>d 50</td> <td>d 110</td> <td></td> </tr> </table> <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">d 160</td> <td style="width: 50%;">d 200</td> </tr> <tr> <td>d 180</td> <td>d 225</td> </tr> </table>	d 32	d 63	d 125	d 40	d 90		d 50	d 110		d 160	d 200	d 180	d 225		
d 32	d 63	d 125															
d 40	d 90																
d 50	d 110																
d 160	d 200																
d 180	d 225																

Item	No.	Text	Price each	Total										
16.2		<p>KH Ball Valve with pipe identical Passage Area of Application up to 10 bar (gas)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 - BS 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) <p>Available in dimensions:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">d 20</td> <td style="width: 50%;">d 63</td> </tr> <tr> <td>d 25</td> <td>d 90</td> </tr> <tr> <td>d 32</td> <td>d 110</td> </tr> <tr> <td>d 40</td> <td>d 125</td> </tr> <tr> <td>d 50*</td> <td></td> </tr> </table> <p>* BS d 63 – d 225 is required</p>	d 20	d 63	d 25	d 90	d 32	d 110	d 40	d 125	d 50*			
d 20	d 63													
d 25	d 90													
d 32	d 110													
d 40	d 125													
d 50*														

Item	No.	Text	Price each	Total
16.3		<p>KHW Ball Valve with pipe identical Passage Area of Application up to 16 bar (water)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 - BS 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 <p>Available in dimensions: d 32 d 40 d 50* d 63</p> <p>* BS d 63 – d 225 is required</p>		
16.4		<p>AKHP Tapping Ball Valve Combination of HD-PE ball valve and weld-on saddle</p> <p>Features:</p> <ul style="list-style-type: none"> - HD-PE compact component - 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 13.1 and 15.1 <p>Available in dimensions: d 110/ 63 d 160/ 63 d 225/ 90 d 110/ 90 d 160/ 90 d 125/ 90 d 180/ 90</p> <p>Assembly advice</p> <ul style="list-style-type: none"> - 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. 		

Item	No.	Text	Price each	Total
16.5		<p>AKHP TL Tapping Ball Valve Top-Loading A combination of HD-PE ball valve and weld-on saddle for the flexible adaptation to all pipe diameters in indicated range of dimensions.</p> <p>Features: see Items 13.3, 15.1 and 15.3</p> <p>Available in dimensions: d 250 - 560/ 90</p> <p>Assembly Advice</p> <ul style="list-style-type: none"> - use an external tapping tool for tapping the HD-PE pipe through the opened FRIALEN® tapping ball valve. - the FRIALEN® FRIATOP clamping device (see Item 21) is required for clamping onto the pipe before or during the fusion process. - we recommend the tapping tool by Fa. Hütz + Baumgarten. 		
16.6		<p>BS Installation kits for Ball Valves and Tapping ball Valves Activating lever system (telescopic) to activate FRIALEN®-KHP, KH*, AKHP and AKHP TL from the street cap.</p> <p>Features:</p> <ul style="list-style-type: none"> - may be smoothly adjusted in indicated range (pipe cover H) without tools, even once installed. - self-bearing at each setting. - corrosion protected - design with key width 14 especially for domestic service connection range. <p>Available in dimensions: 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)</p> <p>¹ Solid fit of the pipe sleeve socket due to the covered housing design</p> <p>* BS d 63 – d 225 is required for KH d 50</p>		

Item	No.	Text	Price each	Total
17.0		Flange T-Piece for the direct connection of hydrant or valves		
17.1		<p>FLT Flange T-Piece Area of Application up to 16 bar (water)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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: <ul style="list-style-type: none"> • installation possible without holding device • 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 <p>Available in dimensions:</p> <p>SDR 11: d 110/ DN 80 d 125/ DN 80 d 160/ DN 80 d 180/ DN 80 max. operating pressure 16 bar</p> <p>SDR 17: d 225/ DN 80 max. operating pressure 10 bar</p>		

Item	No.	Text	Price each	Total
17.2		<p>WF 90° 90°-Elbow with Base Unit</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 <p>Available in dimensions: d 90 d 110</p>		
17.3		<p>WFGB Elbow 90° with base unit and HD-PE / GGG adapter for connection to BAIO® spigot hydrant</p> <p>Features:</p> <ul style="list-style-type: none"> - HD-PE compact component for connection of hydrant with spigot of the BAIO® system alongside the mains. - BAIO® coupler connection made from ductile cast iron for shut-off with axial tightness. Includes sealing ring. - BAIO® cast iron coupler permanently and immovably anchored in PE moulded part. - integrated domestic service connection spigot d 63/SDR 11 to prevent stagnation. - base unit and elbow as homogenous unit, assembly of base plate possible on foundation. - the elbow with separate fusion zones allows for a simple and stress free fusion process. - exposed heating coils for ideal heat transfer, - great insertion depth, - wide fusion zone - cold zones on the sides and in the centre to prevent 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 <p>Available in dimension: d 110/DN 80</p>		

Item	No.	Text	Price each	Total
17.4		<p>TGB T-Piece with HD-PE / GGG adapter for connection of BAIO® spigot hydrant</p> <p>Features:</p> <ul style="list-style-type: none"> - HD-PE compact component for the connection of a DN 80 hydrant with spigot directly on the mains (vertical installation) or a DN 80 valve (horizontal installation) in line with the BAIO®-System alongside the mains. - BAIO® coupler connection from ductile cast iron for shut off with axial tightness. Includes seal ring. - BAIO® cast iron coupler is permanently and immovably anchored in PE moulded part. - the T-piece with separate fusion zones ensures a simple and stress free fusion process. - exposed heating coils for ideal heat transfer, - great insertion depth, - wide fusion zone - cold zones at the sides and in the centre to prevent 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 <p>Available in dimensions:</p> <ul style="list-style-type: none"> d 110/DN 80 d 125/DN 80 d 160/DN 80 		

Item	No.	Text	Price each	Total
17.5		<p>FLR Flange Reducer</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 <p>Available in dimensions:</p> <ul style="list-style-type: none"> d 110/ DN 80 d 160/ DN 100 		

Item	No.	Text	Price each	Total
18.0		Full Faced Flanges (Spigot Fittings)		
18.1		<p>EFL Full Faced Flanges (Spigot Fittings) Area of application up to 16 bar (water) or 10 bar (gas)</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 - 3.1 on request <p>Available in dimensions:</p> <ul style="list-style-type: none"> 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) 		

Item	No.	Text	Price each	Total
19.0		Repair and Reinforcing Saddles		
19.1		<p>RS Reinforcing Saddles</p> <p>Features:</p> <ul style="list-style-type: none"> - HD-PE compact component - manufactured from 2 HD-PE saddles 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 - acceptance certificate to DIN EN 10 204 - 3.1 on request <p>Available in dimensions:</p> <p>d 63</p>		

Item	No.	Text	Price each	Total
19.2		<p>VVS Repair and Reinforcing Saddles</p> <p>Features:</p> <ul style="list-style-type: none"> - HD-PE compact component - 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 - acceptance certificate to DIN EN 10 204 - 3.1 on request <p>Available in dimensions:</p> <ul style="list-style-type: none"> d 90 d 110 d 125 d 160 d 180 d 200 d 225 		

Item	No.	Text	Price each	Total
19.3		<p>RS XL Repair Saddles XL</p> <p>Features:</p> <ul style="list-style-type: none"> - HD-PE compact component - for the repair of damages such as scratches, grooves or pipe penetration - for large repair area d_R 230mm - 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 - acceptance certificate to DIN EN 10 204 - 3.1 on request <p>Assembly advice: May be clamped onto pipe before or during fusion using FRIATOOLS® - clamping device VACUSET XL (see Item 22).</p> <p>Available in dimensions: d 500 d 560 d 630 d 710 d 800 d 900 d 1000 d 1200</p>		

Item	No.	Text	Price each	Total
19.4		<p>VSC TL Repair Saddles Top-Loading</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 - 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 <p>Assembly advice: May be clamped onto pipe before or during fusion using FRIATOOLS®</p> <ul style="list-style-type: none"> - clamping device FRIATOP (see Item 21). <p>Available in dimensions: d 250 – d 560</p>		

Item	No.	Text	Price each	Total
20.0		<p>FRIANET® Water Conduit Installation Kit for internal installation of a PE conduit in an existing domestic water service pipe of PE including the integration of the connecting interfaces for optical waveguides (FTTH).</p>		
20.1		<p>YLASW Water Conduit Installation Kit, Version Y consisting of</p> <ul style="list-style-type: none"> - reducer MR d 50/40 - Y-piece YS d 40-40-50 - Installation kit d 40/7 <p>Features:</p> <ul style="list-style-type: none"> - economic solution by using existing domestic water service pipe - safe processing by using a standard process (fusion process) - the used materials, which have contact with drinking water, comply with DVGW requirements (KTW, W270) - no stagnation areas, no danger of contamination of the drinking water - no negative influence of the hydraulic power - homogeneous and pressure-tight connections - reproducible processing quality because of the FRIATOOLS equipment - HD-PE compact components - 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 - acceptance certificate to DIN EN 10 204 - 3.1 on request <p>Available in dimensions: d 40/7</p>		

Item	No.	Text	Price each	Total
20.2		<p>TLASW Water Conduit Installation Kit, Version T consisting of</p> <ul style="list-style-type: none"> - T-piece TA d 40 - Coupler MB d 40 - Installation kit d 40/7 <p>Features:</p> <ul style="list-style-type: none"> - economic solution by using existing domestic water service pipe - safe processing by using a standard process (fusion process) - the used materials, which have contact with drinking water, comply with DVGW requirements (KTW, W270) - no stagnation areas, no danger of contamination of the drinking water - no negative influence of the hydraulic power - homogeneous and pressure-tight connections - reproducible processing quality because of the FRIATOOLS equipment - HD-PE compact components - 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 - acceptance certificate to DIN EN 10 204 - 3.1 on request <p>Available in dimensions: d 40/7</p>		

Item	No.	Text	Price each	Total
21.0		<p>FRIATOP Clamping Device</p> <p>For clamping FRIALEN[®] saddle parts in top loading design in indicated diameter range onto HD-PE pipe before or during fusion.</p>		
22.0		<p>VACUSET XL clamping unit</p> <p>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.</p>		
23.0		<p>UNITOP Clamping Device</p> <p>For clamping FRIALEN spigot saddles SA UNI in the indicated diameter range d 250 – d 800 onto HD-PE pipes before or during fusion.</p>		
24.0		<p>FWAB XL / FWAB ASA Drilling device</p> <p>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.</p> <p><u>Available for dimensions:</u></p> <p>d 90 d 110 d 125 d 160 d 225 d 250</p>		
25.0		<p>FWDPA SA Pressure sample adapter</p> <p>For the spigot saddle SA UNI a leak test can take place after the fusion process and before tapping the HD-PE piping</p>		

Item	No.	Text	Price each	Total
26.0		<p>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.</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 <p>Assembly advice: Processing with a standard tensioning belt or by using FRIATOOLS® - clamping device FIXBLOC FWFB (Order-Ref. 613380)</p> <p>Available in dimensions: d 160 – 1600</p>		
26.1		<p>FIXBLOC FWFB Clamping device</p> <p>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 -.</p>		

Item	No.	Text	Price each	Total																
27.0		<p>Purge stack 1" + 2" for venting HD-PE gas pipes GAB 1 + GAB 2</p> <p>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.</p> <p>Features:</p> <ul style="list-style-type: none"> - 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 <p>Available in dimensions:</p> <table border="0"> <tr> <td>GAB 1:</td> <td>GAB 2:</td> </tr> <tr> <td>RD 0,7 – 1,0 d 63/1"</td> <td>RD 0,7 – 1,0 d 63/2"</td> </tr> <tr> <td>RD 0,7 – 1,0 d 90/1"</td> <td>RD 0,7 – 1,0 d 90/2"</td> </tr> <tr> <td>RD 0,7 – 1,0 d 110/1"</td> <td>RD 0,7 – 1,0 d 110/2"</td> </tr> <tr> <td>RD 0,7 – 1,0 d 125/1"</td> <td>RD 0,7 – 1,0 d 125/2"</td> </tr> <tr> <td>RD 0,7 – 1,0 d 160/1"</td> <td>RD 0,7 – 1,0 d 160/2"</td> </tr> <tr> <td>RD 0,7 – 1,0 d 180/1"</td> <td>RD 0,7 – 1,0 d 180/2"</td> </tr> <tr> <td>RD 0,7 – 1,0 d 225/1"</td> <td>RD 0,7 – 1,0 d 225/2"</td> </tr> </table>	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"		
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"																			