VEXVE

VEXVE ARMATURY GROUP

Hot tapping equipment and valve instruction manual

Contents

NOTE:

This manual should be read carefully and its instructions must be followed in connection with the installation, use and maintenance of the hot tapping equipment and valve.

These instructions are general nature and do not cover all possible operating scenarios. If needed, the manufacturer provides additional instructions regarding the installation, use and maintenance of the hot tapping equipment and valves. If you are not sure about the suitability of the products for the intended use, please contact the manufacturer.

Vexve Oy reserves the right to make alterations to these instructions.

Vexve Oy is not responsible for damages caused by incorrect transportation, handling, installation, operation or maintenance. Furthermore, Vexve Oy is not responsible for damage caused by foreign objects or impurities.

Warranty

Warranty according to Vexve Oy's "General terms and conditions of sale".

The warranty covers manufacturing and material faults. The warranty does not apply to damages caused by inappropriate installation, operation, maintenance, or storage ie. these instructions must be followed for the warranty to apply. Vexve Oy requires that any faulty products under warranty are to be returned to the factory for inspection. Only after the product has been found faulty, Vexve Oy can grant compensation.

Please refer to Vexve Oy's "General terms and conditions of sale" for detailed warranty clauses. The document is available from the manufacturer

Warnings and symbols

Ignoring the warnings and symbols may lead to serious injury or equipment damage. Persons authorized to use the equipment must be familiar with the warnings and instructions.

Appropriate transportation, storage and installation as well as careful commissioning are essential to ensure faultless and stable operation.

The following symbols are used in this manual to draw attention to actions essential to ensure the proper use and safety of the device.

Meaning of the symbol: NOTE

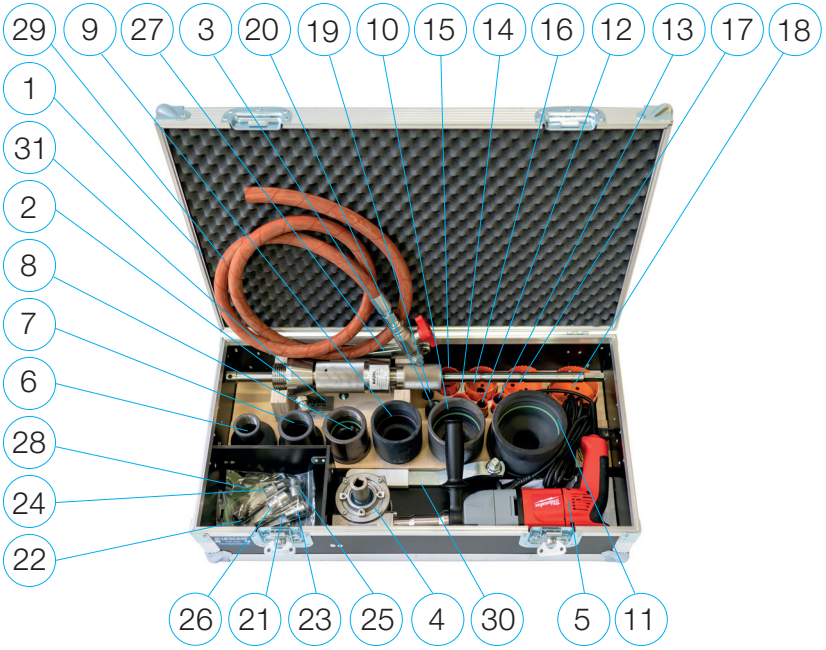
The NOTE symbol is used for actions and functions that are essential for the proper use of the device. Ignoring this symbol may have harmful consequences.

Meaning of the symbol: WARNING

The WARNING symbol is used for actions and functions that, if carried out incorrectly, may lead to injury or equipment damage.

1. List of Parts

1.1 Hot tapping equipment DN 25–100 / 287195



Part nro	Code	Description
1	400001	Case for equipment
2	400062	Frame assembly
3	286152	Draining valve
4	400061	Angle attachment
5	400009	Power drill
6	400027	Adapter, DN 20–25
7	400028	Adapter, DN 32–40
8	400029	Adapter, DN 50
9	400030	Adapter, DN 65
10	400031	Adapter, DN 80
11	400032	Adapter, DN 100
12	400042	Hole saw, DN 25
13	400043	Hole saw, DN 32
14	400044	Hole saw, DN 40
15	400045	Hole saw, DN 50
16	400046	Hole saw, DN 65

Part nro	Code	Description
17	400047	Hole saw, DN 80
18	400048	Hole saw, DN 100
19	40003930	Drill chuck, DN 25–32
20	40004030	Drill chuck, DN 40–150
21	400049	Center drill, 6.5 mm
22	400055	Hex key, 4 mm
23	400075	Socket, 6k-9
24	400076	Socket, 6k-10
25	400077	Socket, 6k-15
26	400078	Socket, 6k-19
27	400050	Hook wrench, 80-90 mm
28	400056*	Set of seals
29		Draining valve hose
30	288752	Handle, ½", DN 25-150
31	298803	Sticker

1.2 Extension parts of equipment DN 125–150 / 287195L

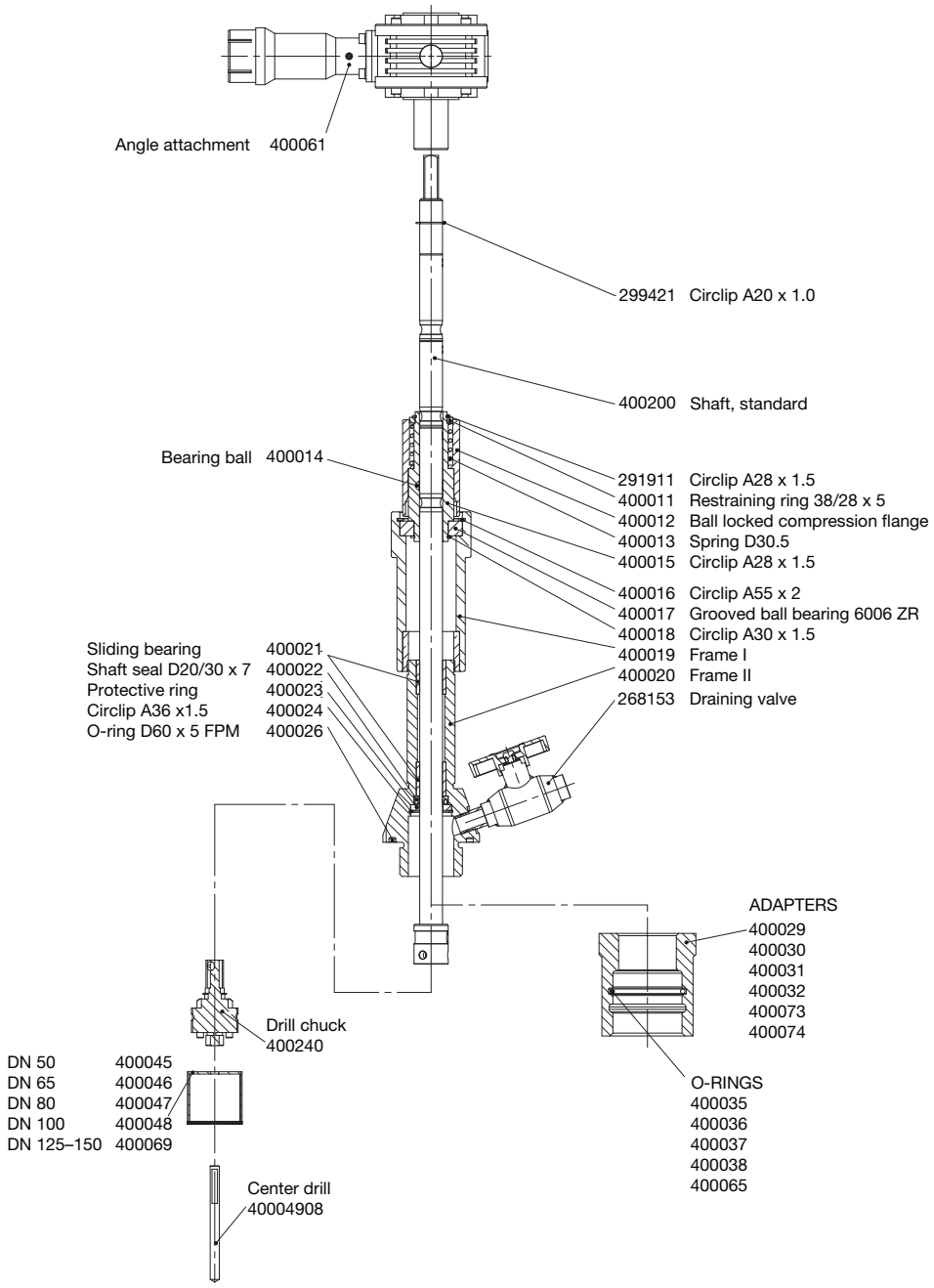
Code	Description
400065	2 pcs O-rings, D139.07 x 5.33 FPM DN 125/150 adapter
400073	Adapter DN 125
400074	Adapter DN 150
400069	Hole saw DN 125 FB, DN 150 RB

1.3 Hot tapping equipment repair kit 400056

Code	Description
400033	O-ring, D33 x 3 FPM for DN 20–25 adapter
400034	O-ring, D47 x 3 FPM for DN 32–40 adapter
400035	O-ring, D58 x 5 FPM for DN 50 adapter
400036	O-ring, D75 x 5 FPM for DN 65 adapter
400037	O-ring, D88 x 5 FPM for DN 80 adapter
400038	O-ring, D113.67 x 5.33 FPM for DN 100 adapter
400026	O-ring, D60 x 5 FPM
400022	Shaft seal, D20/30 x 7

1.4 Exploded view DN 50–150

DN 50–150



2. Preparations

2.1 Preparing the pipe and valve

Locate the exact point for the connection on the body of the main pipe and prepare the main pipe for welding of the valve. Check the position of the connection on the body pipe, taking into account the position of the weld seam on the body pipe (threaded seam pipes: avoid installing the valve on top of the longitudinal seam). The MAG or stick welding method is recommended for welding.

The welding end of the hot tapping valve must be shaped according to the radius (“R”) of the body pipe (see figure 1) and the welding as required for the best welding result taking into account the given installation dimensions.

The welder is responsible for ensuring that the connection meets the local the dimension and strength requirements of the legislation. If necessary, the connection should be reinforced with a support collar. Quality requirement ISO 5817 class C.

NOTE: Shaping or shortening of the thread end of the valve can only be done after drilling.

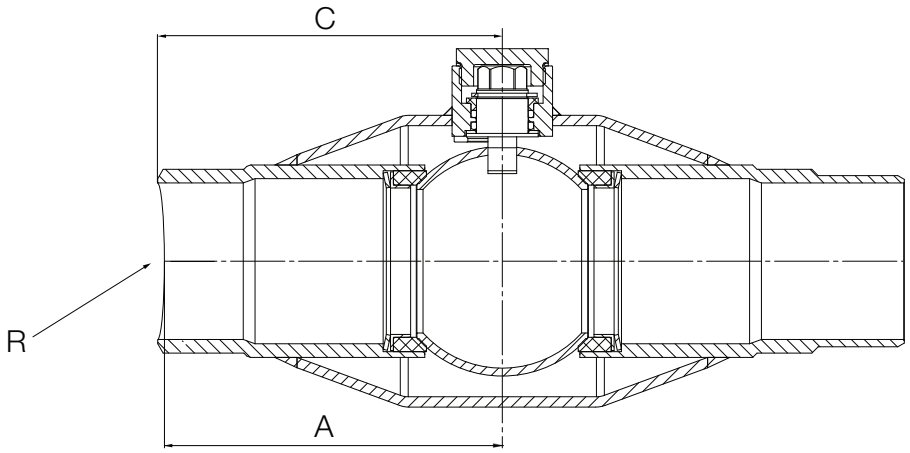


Figure 1.

The valve can be welded at an angle of 0 – 360° to the main pipe (figure 2) and the valve must be perpendicular to the longitudinal center line of the main pipe (figure 3).

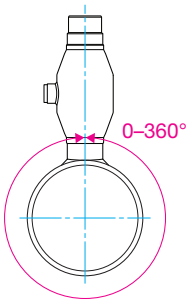


Figure 2.

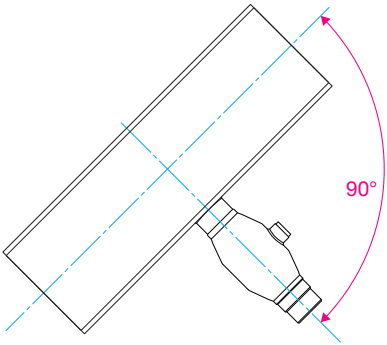


Figure 3.

NOTE:
After welding, the tightness of the seam should be tested e.g. by pressure testing the connection with compressed air through the hot tapping equipment's draining valve.

2.2 Preparing the hot tapping equipment

Select the hole saw and the chuck according the valve's DN size and corresponding adapter. First, install the adapter to the equipment and then the chuck package (drill chuck + center drill bit + hole saw) on the shaft of the tool.

Check that the edge of the body part (Frame 1) is aligned with the locking groove on the body part (Frame 2). This is when the hot tapping equipment's drill bit is fully retracted. **Under no circumstances should the drill bit feed be opened more while the equipment is under pressure.**

Make sure that the valve is fully **OPEN**. Attach the complete equipment assembly on to the hot tapping valve.

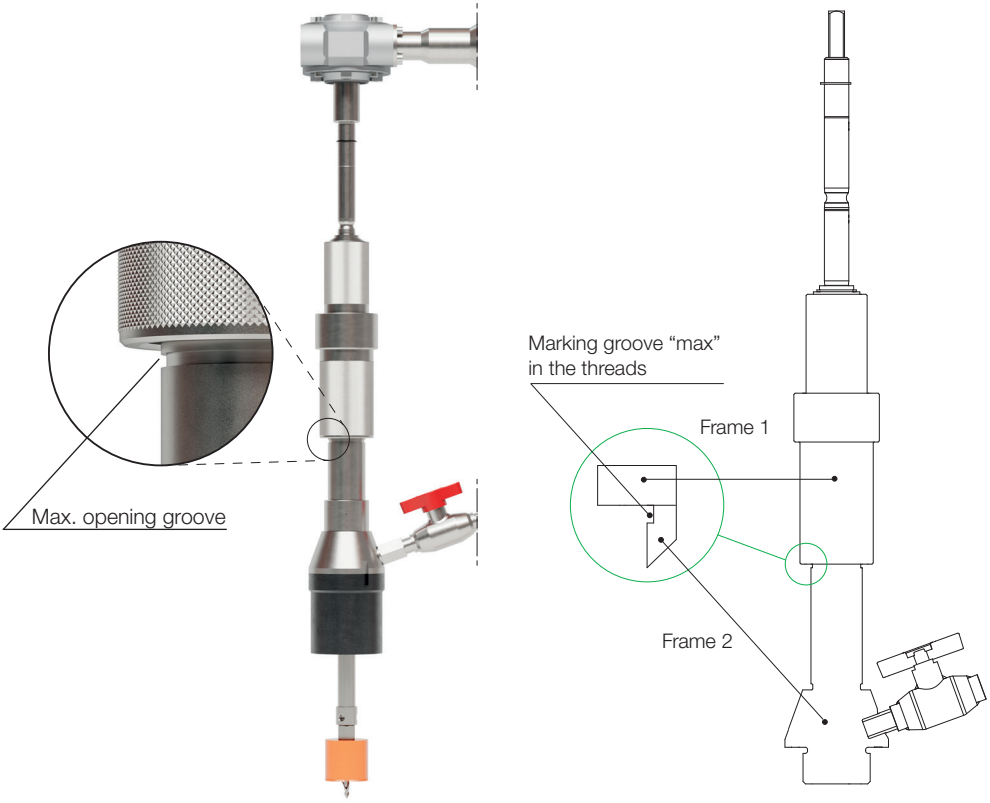


Figure 4.

Install the draining valve with hoses on frame part II and close the draining valve.

Before drillling:

- Check that the hot tapping valve can be closed: unlock the shaft of the hot tapping equipment and pull the shaft as far out as possible (the hole saw or chuck goes against the protective ring of the shaft guard inside the unit), then close and open the valve to check that it can be closed.
- Ensure that the hole saw slides smoothly through the ball of the hot tapping valve: make sure the hot tapping valve is fully open, unlock the shaft of the hot tapping equipment and push the shaft as far in as possible while ensuring that the hole saw passes perfectly through the hot tapping valve.
- Choose the correct locking groove corresponding to the size of the hot tapping valve, there are three (3) grooves (figure 5). Lock the shaft on the chosen groove.

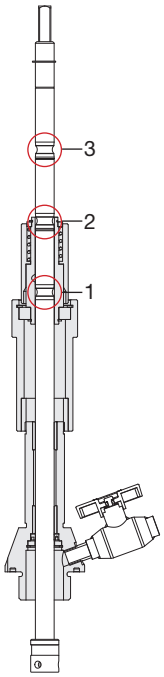
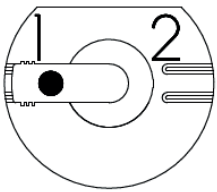


Figure 5.

3. Hot tapping

3.1 Checklist for the power drill

- the direction of rotation of the power machine must be clockwise
- under no circumstances must the power machine have a IMPACT switched on
- select gear speed: I or II position (figure 6)
- set the speed on a scale from A to F (figure 7)



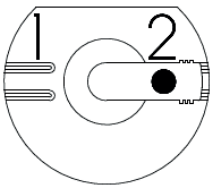


Figure 6.

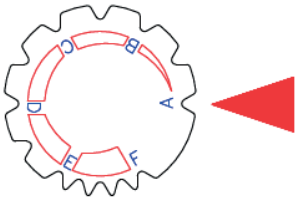


Figure 7.

WARNING!
The power machine must NOT have a IMPACT on under any circumstances.

3.2 Drilling

When starting the drilling, i.e. center drilling, use high rotational speed: 460 r/min (6,5 mm center drill), gear II and position F. Feed the drill as steadily and smoothly as possible During drilling, it is recommended to keep the draining valve open to remove the cuttings.

After the center drill has gone through, stop feeding and drilling and close the draining valve. After that, reduce the rotational speed to the given rotation speed for the hole saw drilling.

Execute the actual drilling as the center drilling: Feed the hole saw as steadily and smoothly as possible. You can keep the draining valve open during the drilling but close it after finishing.

Release the shaft locking and slide the shaft to its outermost position **(due to pressure in the valve, the shaft slides out automatically)**, then close the hot tapping valve. Open the draining valve to release the pressure from the hot tapping valve.

WARNING! Before releasing the shaft's locking mechanism, move your head away from the shaft end to avoid impact. The shaft will slide out rapidly due to pressure.

NOTE! Before removing the hot tapping equipment from the hot tapping valve, make sure that the hot tapping valve is fully closed. The hot tapping valve must be in the marked closing position. The closing tightness of the hot tapping valve must be verified when the draining valve is in open position without any noticable leakeage.

Disassembling hot tapping equipment tool: First, remove the draining valve and after that the whole equipment (incl. adapter) from the hot tapping valve. Disassemble the hot tapping equipment in the reverse order as when assembling. After hot tapping especially the stem of the isolated valve must be plugged by welding.

1. Before welding remove the plug and seal.
2. Make sure that the valve is in an open position.
3. Put the plug back in without the PTFE seal and make sure that there’s around a 1 mm gap between the plug and the stem bush.
4. Weld the plug to the stem bush.

NOTE! The PTFE seal must be removed before welding the plug.

3.3 Technical criteria for power drill

We recommend following power drill options:

- Milwaukee PD2E 24RS
- AEG SB2E 1200 RST

When using other power drills (type, brand), the power drill must fulfil following requirements:

- input power min. 1000 W
- speed of revolution: Gear I: - 0 - 1000 r/min, Gear II: 0 - 3000 r/min.
- speed adjustment is required to select the speeds given to the different hole saws
- the drill's neck diameter must be Ø 43 mm

NOTE: For other possible power drill choices, consult the manufacturer to ensure suitability for hot tapping

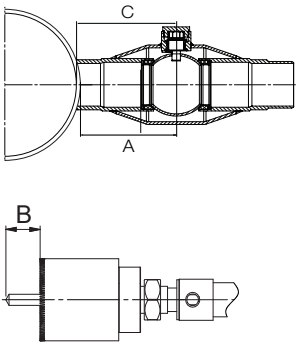
4. Installation dimensions and RPM settings

4.1 DN 25, full bore

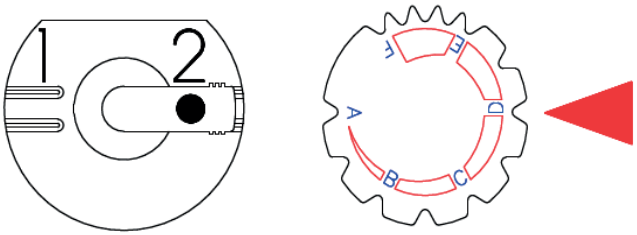
Locking groove no 1

Hole saw Ø 24 mm

Main pipeline size	B	A L-dimension: 209		C
DN 32	20	99	+0 -5	105
DN 40	20	100	+0 -10	105
DN 50	20	101	+0 -10	105
DN 65	20	102	+0 -10	105
DN 80	20	102	+0 -10	105
DN 100	20	103	+0 -10	105
DN 125	20	103	+0 -10	105
DN 150	20	103	+0 -10	105
DN ≥ 200	20	105	+0 -10	105



Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 370 r/min, II-gear, D-position



When drilling a DN 32 line, the feed should be stopped 10 mm before the maximum feeding distance, for other sizes the maximum feeding distance can be used.

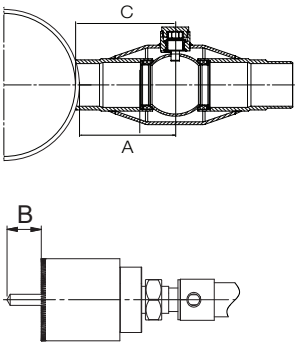
The A dimensions apply to both Lenox and Sandvik hole saws.

4.2 DN 32, full bore

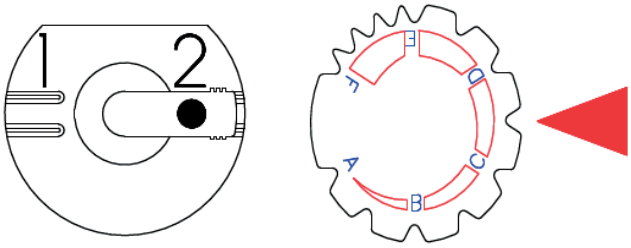
Locking groove no 1

Hole saw Ø 30 mm

Main pipeline size	B	A	C
		L-dimension: 209	
DN 40	20	85 +2 -0	93
DN 50	20	87 +0 -10	93
DN 65	20	89 +0 -10	93
DN 80	20	90 +0 -10	93
DN 100	20	91 +0 -10	93
DN 125	20	91 +0 -10	93
DN 150	20	92 +0 -10	93
DN 200	20	92 +0 -10	93
DN 300	20	92 +0 -10	93
DN 400	20	92 +0 -10	93
DN ≥500	20	93 +0 -10	93



Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 285 r/min, II-gear, C1-position



When drilling a DN 40 line, the feed should be stopped 10 mm before the maximum feeding distance and in DN 50 line 15 mm before the maximum feeding distance. For other sizes, the maximum feeding distance may be used.

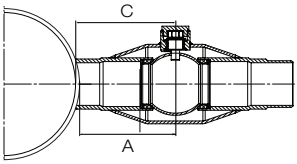
The A dimensions apply to both Lenox and Sandvik hole saws.

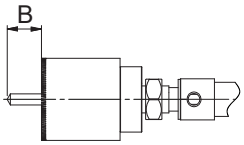
4.3 DN 40, full bore

Locking groove no 2

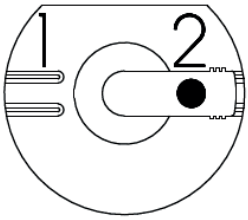
Hole saw Ø 38 mm

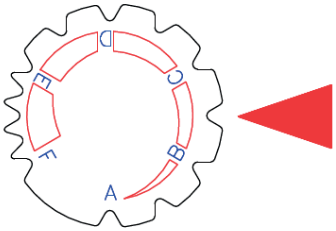
Main pipeline size	B	A		C
		L-dimension: 228		
DN 50	20	90	+0 -10	111
DN 65	20	93	+0 -10	111
DN 80	20	94	+0 -10	111
DN 100	20	95	+0 -10	111
DN 125	20	96	+0 -10	111
DN 150	20	96	+0 -10	111
DN 200	20	97	+0 -10	111
DN ≥300	20	98	+0 -10	111





Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 230 r/min, II-gear, B1-position





For sizes DN ≥100 it is recommended to use the installation dimension A' = A - 10 mm. This will ensure the drill through with thicker wall thicknesses.

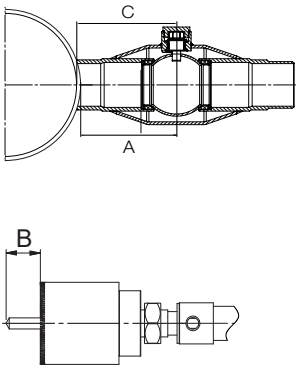
The A dimensions apply to the Lenox hole saw. When using Sandvik hole saw, subtract 10 mm from the A-dimensions. This will ensure the drill through. (Sandvik's Ø 38 hole saw is 10 mm lower than the corresponding Lenox hole saw).

4.4 DN 50, full bore

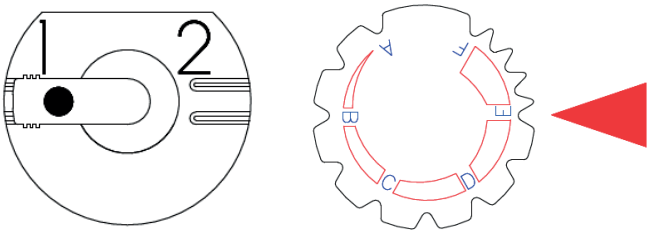
Locking groove no 2

Hole saw Ø 48 mm

Main pipeline size	B	A		C
		L-dimension: 260		
DN 65	20	120	+0 -0	131
DN 80	20	121	+0 -10	131
DN 100	20	124	+0 -10	131
DN 125	20	126	+0 -10	131
DN 150	20	127	+0 -10	131
DN 200	20	128	+0 -10	131
DN 300	20	129	+0 -10	131
DN 400	20	129	+0 -10	131
DN ≥500	20	131	+0 -10	131



Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 180 r/min, I-gear, E-position



When drilling a DN 65 line, the feed ingshould be stopped at 10 mm from the maximum feeding distance. For other sizes, the maximum feeding distance can be used.

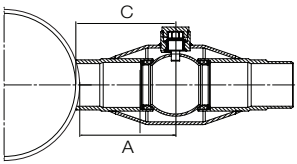
The A dimensions apply to both Lenox and Sandvik hole saws.

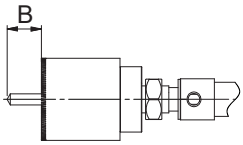
4.5 DN 65, full bore

Locking groove no 2

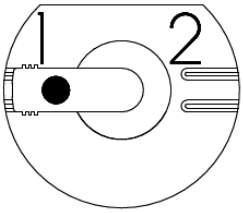
Hole saw Ø 64 mm

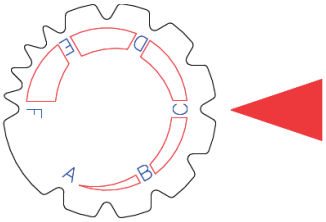
Main pipeline size	B	A	C
		L-dimension: 280	
DN 80	20	111 +2 0	140
DN 100	20	116 +2 0	140
DN 125	20	118 +2 0	140
DN 150	20	120 +2 0	140
DN 200	20	122 0 -5	140
DN 300	20	124 0 -5	140
DN 400	20	125 0 -5	140
DN 500	20	126 0 -5	140
DN 600	20	126 0 -5	140
DN ≥800	20	126 0 -5	140





Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 135 r/min, I-gear, C-position





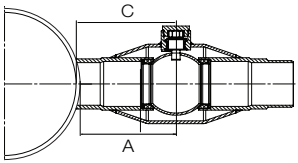
The A dimensions apply to both Lenox and Sandvik hole saws.

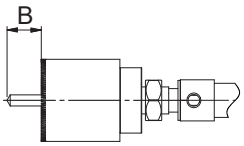
4.6 DN 80, full bore

Locking groove no 3

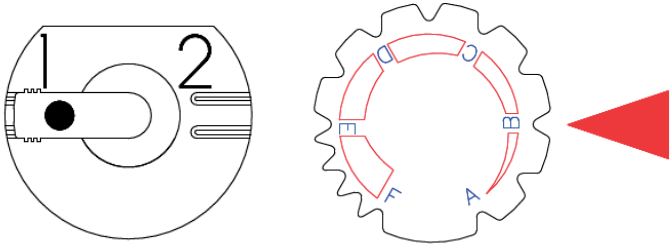
Hole saw Ø 76 mm

Main pipeline size	B	A	C
		L-dimension: 312	
DN 100	20	173 0 -5	204
DN 125	20	177 0 -5	204
DN 150	20	180 0 -5	204
DN 200	20	183 0 -5	204
DN 250	20	185 0 -5	204
DN 300	20	186 0 -5	204
DN 400	20	186 0 -5	204
DN 500	20	187 0 -5	204
DN 600	20	188 0 -5	154
DN ≥800	20	188 0 -5	154





Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 115 r/min, I-gear, B-position



The A dimensions apply to both Lenox and Sandvik hole saws.

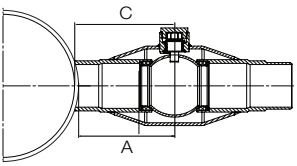
In order to achieve a sufficient length (C=204 mm), it is necessary to weld a 50 mm extension pipe as an extension to the weld seam.

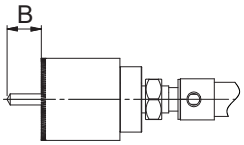
4.7 DN 100, full bore

Locking groove no 3

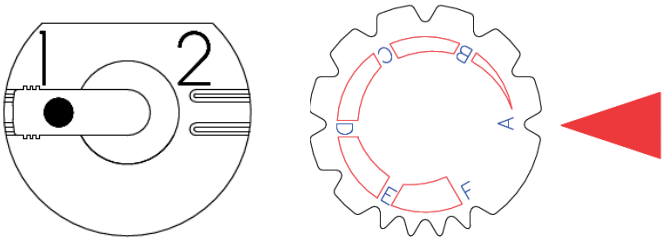
Hole saw Ø 95 mm

		Old construction		New construction H2/23 —>	
Main pipeline size	B	A L-dimension: 349	C	A L-dimension 349	C
DN 125	20	131 +2 0	157	140 +2 0	165
DN 150	20	136 +2 0	157	146 +2 0	165
DN 200	20	141 +0 -2	157	151 +0 -2	165
DN 250	20	144 +0 -2	157	154 +0 -2	165
DN 300	20	147 +0 -5	157	156 +0 -5	165
DN 400	20	148 +0 -5	157	158 +0 -5	165
DN 500	20	150 +0 -5	157	159 +0 -5	165
DN 600	20	150 +0 -5	157	160 +0 -5	165
DN ≥800	20	152 +0 -5	157	165 +0 -5	165





Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 90 r/min, I-gear, A-position



The A dimensions apply to both Lenox and Sandvik hole saws.

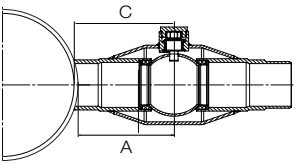
4.8 DN 125, full bore / DN 150, reduced bore

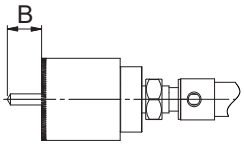
(requires an extension part 287195L)

Locking groove no 3

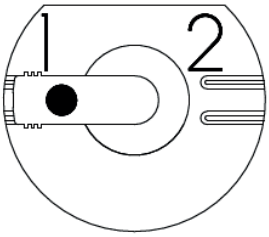
Hole saw Ø 121 mm

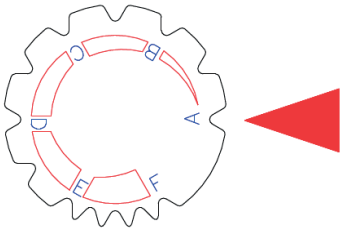
Main pipeline size	B	Old construction DN 125 FB/150 RB A L-dimension: 365	C	New construction DN 125 FB A L-dimension: 385	C	New construction DN 150 RB H2/23 —> A L-dimension: 385	C
DN 200	20	153 +0 -10	175	165 +0 -10	189,5	165 +0 -10	175
DN 250	20	158 +0 -10	175	171 +0 -10	189,5	171 +0 -10	175
DN 300	20	161 +0 -10	175	174 +0 -10	189,5	174 +0 -10	175
DN 400	20	165 +0 -10	175	178 +0 -10	189,5	178 +0 -10	175
DN 500	20	165 +0 -10	175	180 +0 -10	189,5	180 +0 -10	175
DN 600	20	168 +0 -10	175	182 +0 -10	189,5	182 +0 -10	175
DN ≥800	20	170 +0 -10	175	184 +0 -10	189,5	184 +0 -10	175





Center drill speed 460 r/min, II-gear, F-position
Hole saw speed: 75-90 r/min, I-gear, A-position





The A dimensions apply to both Lenox and Sandvik hole saws.

5. Flanged hot tapping valves: DN 150 FB and DN 200 RB

Vexve's standard hot tapping equipment can also be used to drill a full bore DN 150 hot tapping valve. The following points must be taken into account when drilling:

- A longer stem (+200 mm) is required.
- The diameter of the hole saw must be 146 mm and an 8 mm center drill bit must be used.
  Note! Center drill bit speed 200 r/min, gear II, position A
- Instead of the standard adapter, the power drill and valves are equipped with two PN 25 flanges, seals and bolts/nuts. The flange can be dismantled later.
- The valve stem is 6k 32 mm
- The parts' product numbers:
  - Longer stem (Prod. No 400210) and chuck (Prod. No 400240)
  - Hole saw 146 mm (Prod. No 400072)
  - Flange adapter FB DN 150 (Prod. No. 400066) and flange adapter DN 200 RB (Prod. No 400067)

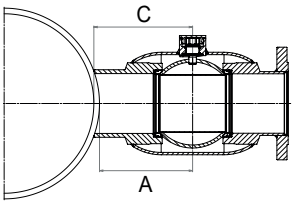
5.1 Flagned DN 150, full bore

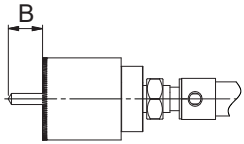
(requires an extension part)

Locking groove no 2

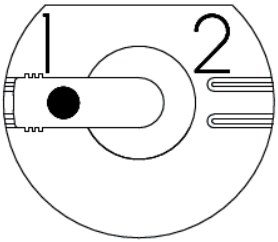
Hole saw Ø 146 mm

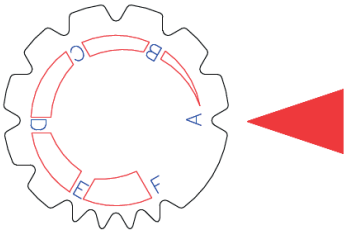
Main pipeline size	B	A		C
		L-dimeonsion		
DN 200	20	230	+0 -10	265
DN 250	20	240	+0 -10	265
DN 300	20	245	+0 -10	265
DN 400	20	250	+0 -10	265





Center drill speed 200 r/min, II-gear, A-position
Hole saw speed: 75-90 r/min,I-gear, A-position





The A dimensions apply to both Lenox and Sandvik hole saws.

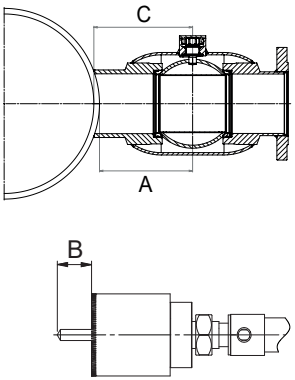
5.2 Flanged DN 200, reduced bore

(requires an extension part)

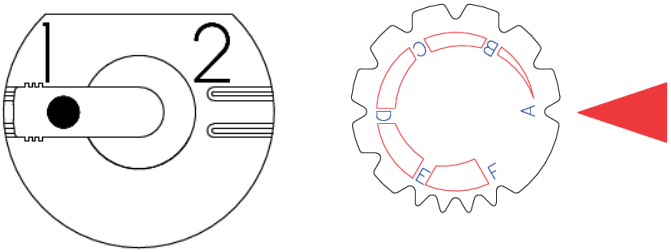
Locking groove no 2

Hole saw Ø 146 mm

Main pipeline size	B	A		C
		L-dimension		
DN 250	20	240	+0 -10	265
DN 300	20	245	+0 -10	265
DN 400	20	250	+0 -10	265
DN ≥500	20	255	+0 -10	265



Center drill speed 200 r/min, II-gear, A-position
Hole saw speed: 75-90 r/min, I-gear, A-position



The A dimensions apply to both Lenox and Sandvik hole saws.

6. Cleaning the hot tapping equiment

NOTE: Cleaning the hot tapping equipment is an important part of maintenance. The hot tapping equipment must be cleaned after each use.

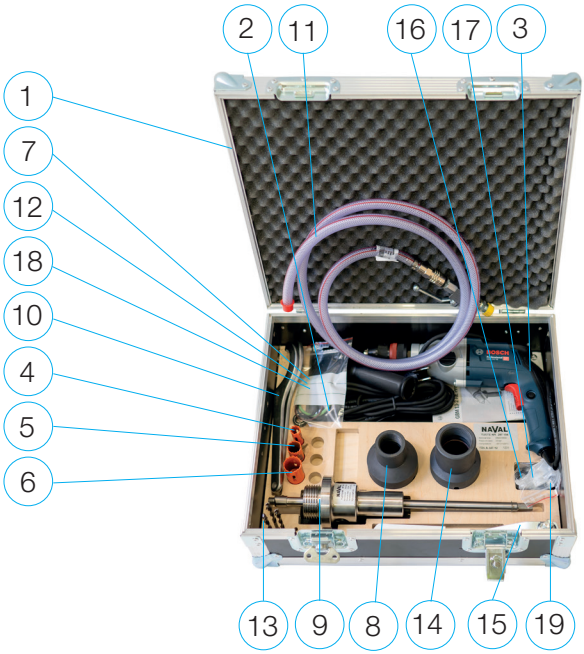
Clean the hot tapping equipment as follows:

1. Fill a jug with clean water.
2. Rinse the body assembly of the hot tapping equipment by pouring water into it. Loose metal shavings and dirt from drilling should be flushed from the inside of the equipment.
3. Also, rinse the equipment by pouring water through the draining valve.
4. Check that no metal shavings remain inside the hot tapping equipment.
5. Dry the hot tapping equipment before placing it back into the case.

7. Checklist for the hot tapping equipment

1. Always read the manual before drilling procedure.
2. Locate the point for the connection on the main pipe and prepare the pipe for welding.
3. Make a visual check of the valve to make sure that there are no damages and try to openand close it. Leave the hot tapping valve to a fully open position.
4. Prepare the end of the valve to match the radius of the main pipe.
5. Weld the valve to the main pipe at a 90° angle to the longitudinal axis of the main pipe. Use support collar when necessary according to local requirements.
6. Mount the adapter (right size to fit the valve size) to the valve and tighten with the hook wrench.
7. Mount hole saw (right size to fit valve size), drill chuck and center drill to the shaft of the tool.
8. Check that the groove on the threaded area of the second frame is aligned with the edge of the first frame to be sure that the tool is in the maximum feeding distance. NOTE! This setup must never be exceeded while the tool is pressurized.
9. Make sure that the valve is fully open and mount the tool to the adapter, tighten with the hook wrench.
10. Test that the hole saw can slide through the valve. NOTE! In this step the welding of the valve shall be pressure tested through the draining valve. A special pressure test adapter is available as spare part!
11. Close the draining valve, slide the shaft out to the outermost position and check that the valvecan be closed. Leave the valve to open position.
12. Lock the shaft to the selected position according to the manual.
13. Open the draining valve and start center drilling using the correct speed: 6 mm center drill bit 460 r/min, gear II, position F. 8 mm center drill bit 200 r/min, gear II, position A. NOTE! The direction of rotation must be clockwise and the stroke must never be on in the power drill.
14. Feed the center drill bit evenly. After the center drill bit has passed through, shut-off the draining valve.
15. Change the speed settings according to the instruction manual (e.g. DN 25 = gear II and position D).
16. Open the draining valve and continue drilling.
17. Feed the hole saw through steadily and smoothly. When the drilling is finished, close the draining valve.
18. Release the shaft locking mechanism and slide the shaft to its outermost position. NOTE! Due to pressure in the valve, the shaft slides out automatically.
19. Close the hot tapping valve.
20. Open the draining valve to release the pressure from the hot tapping valve. This also confirms that the valve is tight.
21. Hot tapping drilling procedure is finished and the tool can be disassembled by first removing draining valve, then the tool from the valve and then the tool from the power drill.

8. List of parts DN 20–32 / 287194



Part no	Code	Description
1	400101	Case for equipment
2	400054	Hex key 3 mm
3	400109	Power drill BOSCH
4	400171	Hole saw DN 20
5	400042	Hole saw DN 25
6	400043	Hole saw DN 32
7	400026	O-ring D60x5 FPM
8	400027	Adapter DN 25
9	400162	Frame assembly
10	400050	Hook wrench 80–90 mm

Part no	Code	Description
11	400025	Draining hose assembly
12	400033	O-ring D 33x3 FPM
13	400049	Center drill 6.5
14	400028	Adapter DN 32-40
15	288752	Hot tapping valve handle
16	400076	Socket wrench 6k-10
17	400075	Socket wrench 6k-9
18	400034	O-ring D 47x3 FPM
19	400156	Spare part kit

VEXVE ARMATURY GROUP

Vexve Oy

Pajakatu 11
38200 Sastamala
Finland

Riihenkalliontie 10
23800 Laitila
Finland

Puh. 010 734 0800
vexve.customer@vexve.com

www.vexve.com