

GH



BIDIRECTIONAL KNIFE GATE VALVE

DESCRIPTION

- Bidirectional knife gate valve.
- Appropriate valve to be used as end of line.
- "Monoblock" one-piece cast iron body.
- Stainless steel gate. Two rubber sleeves.
- Provides high flow rates with low pressure drop.
- Various seat materials available.
- Face-to-face dimension in accordance with **CMO Valves** standard.

GENERAL APPLICATIONS

This knife gate valve is suitable for working in the mining industry, in loaded fluid transport lines, such as: water with stones, sludge, etc. and in general it is used for abrasive fluids in the chemical industry and wastewater.

Designed for the following applications:

- Mining
- Sewage treatment
- Electrical power stations
- Chemical plants
- Energy Sector
- Thermal power stations

SIZES

From DN80-3" to DN900-36"

* Others sizes on request.

WORKING PRESSURE (ΔP)

ASA 150	DN80 - DN600	21 bar
PN25	DN80 - DN600	25 bar
ASA 300 / PN40	DN80 - DN600	40 bar

The pressures indicated in the table, can be used in either of the valve's two directions

* Other pressures, consult.

FLANGE DRILL HOLE

PN10 & ANSI B16.5 (150 LB)

OTHER COMMON FLANGES

- PN 6, PN 16, PN 25, JIS standard
- Australian standard, British standard.



Fig. 1

APPLICATION OF EUROPEAN DIRECTIVES

See document of European Directives applicable to **CMO Valves**.

* For category and zone information, contact technical-commercial department at **CMO Valves**.

QUALITY DOSSIER

All valves are tested hydrostatically at **CMO Valves** and material and test certificates can be provided.

- Body test = working pressure x 1.5
- Seat test = working pressure x 1.1

ADVANTAGES

This knife-gate valve's main characteristic is that it provides a full continuous flow. This means that in open position it produces no cavities and there are no turbulences in the fluid. Appropriate valve to be used as end of line. The **GH** valve's body is composed of one single "monoblock" piece.

The stem protection hood is independent from the handwheel securing nut, this means the hood can be disassembled without the need to release the handwheel. This advantage allows regular maintenance operations to be performed, such as lubricating the stem, etc. The stem on the valve is made of AISI 304 stainless steel. This is another added advantage, as some manufacturers produce it with 13% chrome and it gets rusty very quickly.

The handwheel is made of nodular cast iron. Some manufacturers produce them in normal cast iron which can lead to breakages in the event of very high operating torque or knocks.

The yoke is has a compact design with the bronze actuator nut protected in a sealed and lubricated box. This makes it possible to move the valve with a key, even without the handwheel (in other manufacturers' products this is not possible).

The pneumatic actuator's upper and lower covers are made of nodular cast iron, making them highly shock resistant. This characteristic is essential in pneumatic actuators.

The pneumatic cylinder's o-ring seals are commercial products and can be purchased worldwide. This means it is not necessary to contact **CMO Valves** every time a seal is required.

STANDARD COMPONENTS LIST

COMPONENT	NODULAR IRON
1 BODY	GJS500-7
2 GATE	AISI 304 / DUPLEX / AISI 630
3 SLEEVE	STEEL+NATURAL RUBBER
4 PACKING SEAL	NATURAL RUBBER
5 PACKING	GREASED PACKING
6 PACKING GLAND	STEEL
7 SUPPORT PLATES	STEEL
8 YOKE	STEEL
9 STEM	AISI 303
10 GEAR BOX	---
11 HOOD	STEEL
12 LOWER COVER	STEEL
13 STEM STOPPER	AISI 316
14 PROTECTION CAP	PLASTIC
15 GREASER	STEEL

Table 1

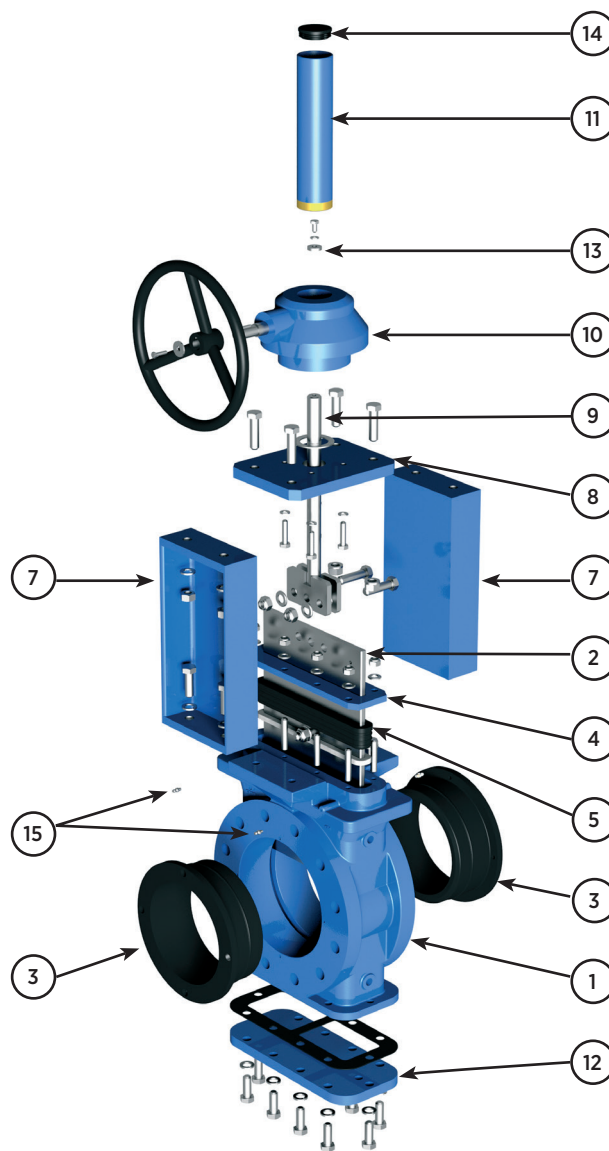


Fig. 2

DESIGN CHARACTERISTICS

1. BODY

- Reinforced monoblock cast-iron body. The body provides a full continuous flow. This means that it produces no cavities in open position, so there is no turbulence in the fluid and load loss is minimal.
- For diameters greater than DN600, the body is machinewelded with the necessary reinforcements to withstand maximum working pressure.
- Designed with full passage to provide large flows with small losses of load.
- The body's internal design prevents any build-up of solids in the gate area.
- The standard manufacturing materials are GGG500 and CF8M stainless steel. Other materials such as A216WCB carbon steel and stainless steel alloys (AISI316Ti, Duplex, 254SMO, Uranus B6, Ni-Resist, Ductile Ni-Resist, etc.) are available to order.
- As standard, iron or carbon steel valves are painted with anti-corrosive protection of 150 microns of EPOXY (colour RAL 5015). Other types of anti-corrosive protections are available on request.

2. KNIFE GATE

The standard manufacturing materials are AISI304 stainless steel in valves with GJS500-7 body and AISI316 stainless steel in valves with CF8M body. Other materials or combinations can be supplied on request. The knife gate is polished on both sides to provide a smooth contact surface with the resilient seal. At the same time, the sharp edges on the knife gate are rounded to prevent the seal being cut. There are different degrees of polishing, anti-abrasion treatments and various options to adapt the valves to the customer's requirements.

3. SEAT (watertight)

The seat on the **GH valve** is composed of two rubber sleeves, located on either side of the body symmetrically, which are subject by sleeve retainers.

The sleeves and the sleeve retainers are made of natural rubber with a metal core which helps to keep their shape and at the same time prevents deformations. Whilst the valve is in open position, the sleeves' elasticity ensures they are joined together permanently, preventing the accumulation of solids between the two parts of the body.

The **GH valve** is designed for abrasive fluids, and therefore, the sleeves protect the entire surface of the body which would be exposed to the abrasive flow. Regarding the sleeves' maintenance, these can be replaced from outside of the valve, making operation easier. It is a seat with two symmetrical parts, below we show a diagram of the seat.

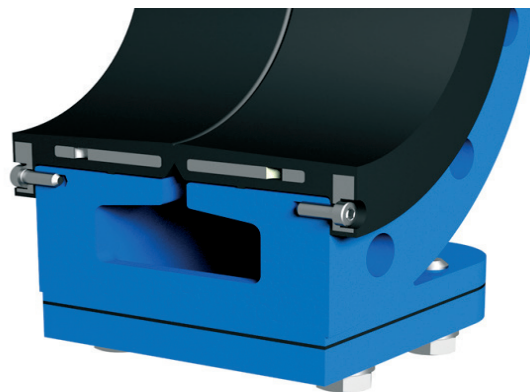


Fig. 3

RESILIENT SEAT MATERIALS

EPDM

This is the standard resilient seat fitted on **CMO valves**. It can be used in many applications, however, it is generally used for water and products diluted in water at temperatures no higher than 90°C*. It can also be used with abrasive products and it provides the valve with 100% watertight integrity.

NITRILE

It is used in fluids containing fats or oils at temperatures no higher than 90°C*. It provides the valve with 100% watertight integrity.

FKM

Suitable for corrosive applications and continuous high temperatures of up to 190°C and peaks of 210°C. It provides the valve with 100% watertight integrity.

SILICONE

Mainly used in the food industry and for pharmaceutical products with temperatures no higher than 200°C. It provides the valve with 100% watertight integrity.

PTFE

Suitable for corrosive applications and pH between 2 and 12. Does not provide the valve with 100% watertight integrity. Estimated leakage: 0.5% of the tube flow.

SEAT/SEALS		
MATERIAL	Tª MÁX (°C)	APLICACIONES
Natural Rubber	90°	General
Polyurethane	90°	General
EPDM (E)	90° *	Water, non-mineral acids and oils
Nitrile (N)	90° *	Hydrocarbons, oils and greases
FKM (V)	200°	Hydrocarbons and solvents

Table 2

Note: More details and other materials available on request.

* **EPDM and Nitrile:** possible until serving temp. Max.: 120°C under request

4. PACKING

Standard gasket is composed of a specially designed EPDM O-ring which provides sealtight integrity between the body and the gate, preventing any type of leakage to the atmosphere. It also has a lubricated gasket strip to help the valve's operation during the opening and closing functions. It is located in an easily accessible place and can be replaced without dismantling the valve from the pipeline.

5. STEM

The stem on the **CMO Valves** valve is made of AISI 304 stainless steel. This characteristic provides high resistance and excellent corrosion-resistant properties. The valve design can be rising stem or non-rising stem. When rising stem is required a stem hood is supplied to protect the stem from contact with dust and dirt, as well as keeping it lubricated.

6. PACKING GLAND

The packing gland allows uniform force and pressure to be applied to the packing to ensure watertight integrity. As standard, valves with cast iron body include GJS500-7 packing glands, whilst valves with stainless steel body have CF8M packing glands.

7. ACTUATORS

All types of actuators can be supplied, with the advantage that thanks to the **CMO Valves** design they are fully interchangeable. This design allows the customer to change the actuators themselves and no extra assembly accessories are required. A design characteristic of **CMO Valves** is that all actuators are interchangeable.

Manual Drives

- Handwheel (*)

- Chain handwheel (*)

- Lever

- Geared motor (*)

- Others (square stem)

Availability of Accessories

- Mechanical stoppers

- Locking devices

- Emergency manual drives

- Electrovalves

- Positioners

- Limit switches

- Proximity detectors

- Straight floor stand (Abb. 4)

- Leaning floor stand (Abb. 5)

Automatic Drives

- Electric actuator (*)

- D/E & S/E pneumatic cylinder

- Hydraulic cylinder

(*) Available in rising and non-rising stem versions.

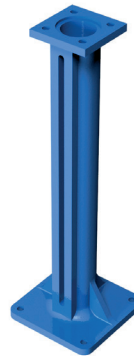


Fig. 4

LEANING FLOOR STANDS.

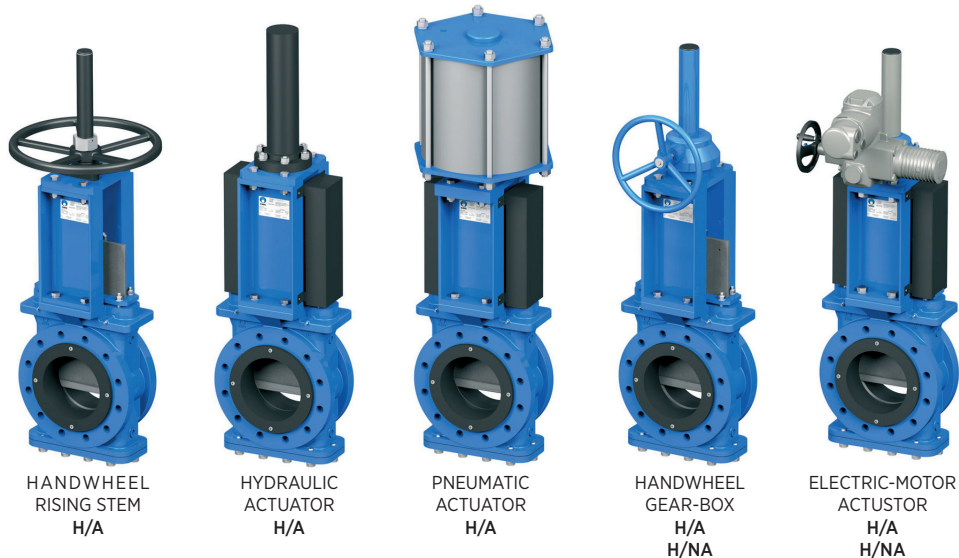


Fig. 5

STRAIGHT FLOOR STANDS.

Stem extensions have also been developed, allowing the drive to be located far away from the valve, to suit all needs. Please ask our engineers beforehand.

H/A = RISING STEM
H/NA = NON-RISING STEM



HANDWHEEL RISING STEM
H/A

HYDRAULIC ACTUATOR
H/A

PNEUMATIC ACTUATOR
H/A

HANDWHEEL GEAR-BOX
H/A
H/NA

ELECTRIC-MOTOR ACTUATOR
H/A
H/NA

Fig. 6

ACCESSORIES AND OPTIONS

Different types of accessories are available to adapt the valve to specific working conditions such as:

MIRROR POLISHED GATE

The mirror polished gate is especially recommended in the food industry and, as standard, in applications in which solids can stick to the gate. It is an alternative to ensure the solids slide off and do not stick to the gate.

PTFE LINED GATE

As with the mirror polished gate, it improves the valve's resistance to products that can stick to the gate.

STELLITED GATE

Stellite is added to the gate's lower edge to protect it from abrasion.

SCRAPER IN THE PACKING

Its function is to clean the gate during the opening movement and prevent possible damage to the packing.

AIR INJECTION IN THE PACKING GLAND

By injecting air in the packing, an air chamber is created which improves the watertight integrity.

HEATING JACKET

Recommended in applications in which the fluid can harden and solidify inside the valve's body. An external jacket keeps the body temperature constant, preventing the fluid from solidifying.

FLUSHING HOLES IN BODY

Several holes can be drilled in the body to flush air, steam or other fluids out in order to clean the valve seat before sealing.

SOLENOID VALVES

For air distribution to pneumatic actuators.

CONNECTION BOXES, WIRING AND PNEUMATIC PIPING

Fully assembled units can be supplied with all the necessary accessories.

MECHANICAL LIMIT SWITCHES, INDUCTIVE SWITCHES AND POSITIONERS

Limit switches or inductive switches are installed to indicate precise valve position, as well as positioners to indicate continuous position.

MECHANICAL LOCKING DEVICE:

Allows the valve to be mechanically locked in a fixed position.

MECHANICAL STROKE LIMITING STOP (MECHANICAL STOPPERS):

These allow the stroke to be mechanically adjusted, limiting the valve run.

EMERGENCY MANUAL ACTUATOR (HAND WHEEL /GEAR BOX)

Allows manual operation of the valve in the event of power or air failure.

INTERCHANGEABLE ACTUATORS

All actuators are easily interchangeable, except the lever.

ACTUATOR OR YOKE SUPPORT

Made of EPOXY-coated steel (or stainless steel to order), its robust design gives it great rigidity in order to withstand the most adverse operation conditions.

EPOXY COATING

All cast iron and carbon steel bodies and components on **CMO Valves** are EPOXY coated, giving the valves great resistance to corrosion and an excellent finish.

CMO Valves's standard colour is blue, RAL-5015.

GATE SAFETY PROTECTION

In accordance with European Safety Standards ("EC" marking), **CMO Valves** automated valves are equipped with gate guards, to prevent any objects from being accidentally caught in the gate.

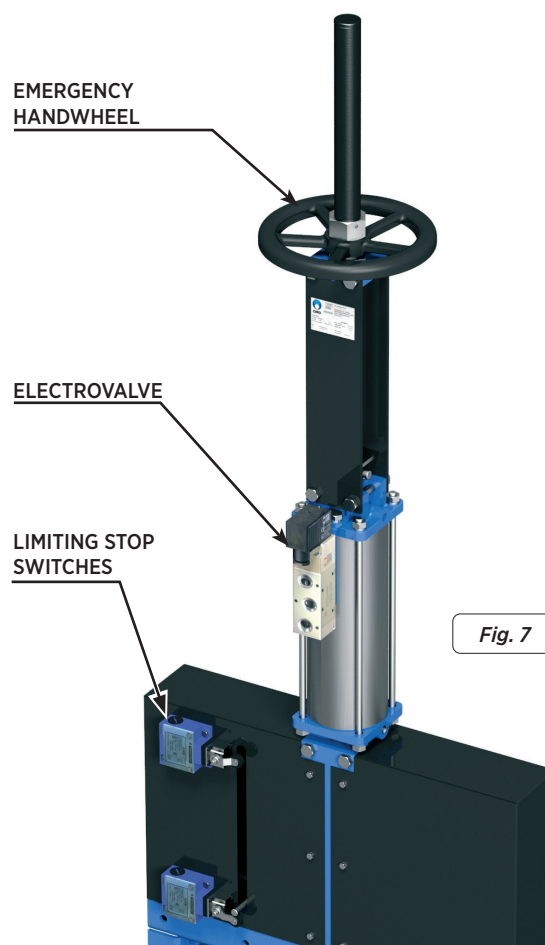


Fig. 7

TYPES OF EXTENSION

When the valve needs to be operated from a distance, the following different types of actuators can be fitted:

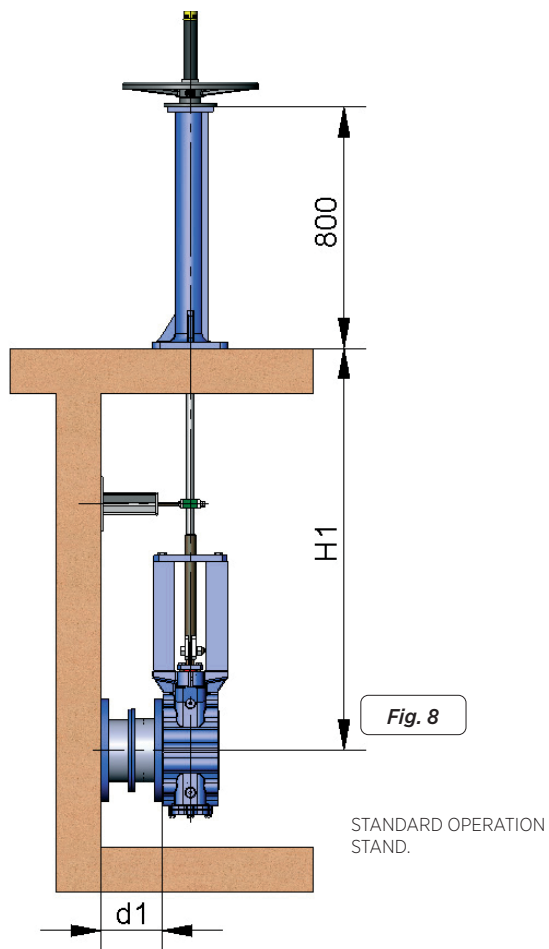


Fig. 8

STANDARD OPERATION STAND.

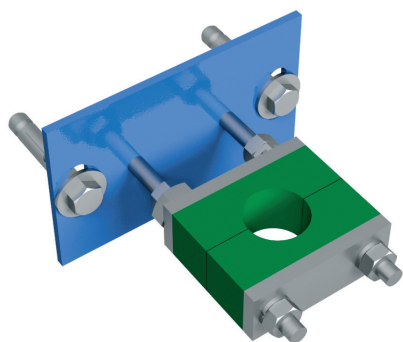


Fig. 9

STEM GUIDE BRACKET

COMPONENT LIST

COMPONENT	STANDARD VERSION
Stem	AISI 304
Rod	AISI 304
Support-Guide	Carbon steel with EPOXY coating
Guide	PA6
Stand	GJS500-7 with EPOXY coating

Table 3

1- FLOOR STAND

This extension is done by coupling a spindle to the stem. The desired extension is achieved by defining the length of the spindle. A floor stand is normally installed to support the drive.

The definition variables are as follows:

H1 = Distance from valve centre to base of the stand

d1 = Separation from the wall to the end of the connecting flange

CHARACTERISTICS:

- It can be coupled to any type of drive.
- We recommend a stem guide bracket every 1.5 m.
- The standard floor stand is 800 mm high.
- Option to use a position indicator to determine the valve's percentage of opening.
- Leaning stand available to order
- Other floor stand measurements available on request.



LEANING STAND.

Fig. 10

2.- PIPE

This consists of raising the drive. The pipe will rotate in the same direction as the wheel when the valve is operated. The valve always remains at the same height.

The definition variables are as follows:

H1 = Distance from valve centre to base of the stand

d1 = Separation from the wall to the end of the connecting flange

CHARACTERISTICS:

- Standard drives: handwheel and top square.
- A pipe guide bracket is recommended every 1.5 m.
- The standard materials are: EPOXY-coated carbon steel and stainless steel.

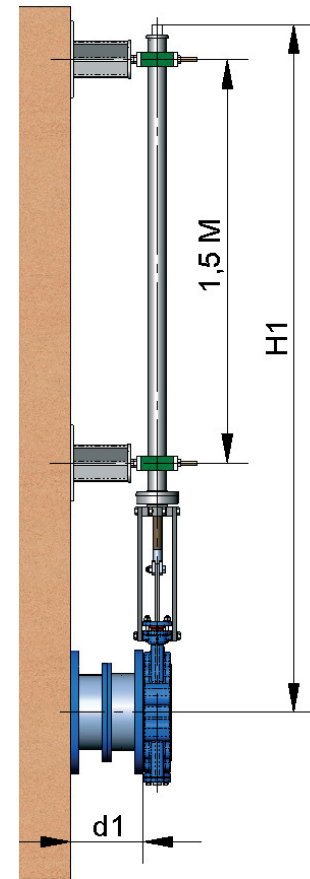


Fig. 11

3.- ELONGATED SUPPORT PLATES

When a short extension is required, it can be achieved by extending the support plates. An intermediate yoke can be fitted to reinforce the support plates structure.



Fig. 12

4.- UNIVERSAL CARDAN JOINT

If the valve and the drive are not in correct alignment, the problem can be resolved by fitting a universal cardan joint. This option is only valid for non-rising stem drives.



Fig. 13

HANDWHEEL

The definition variables are as follows:

B = Max. width of the valve (without drive).

P = Max. height of the valve (without drive).

OPTIONS:

- Locking devices.
- Extensions: stand, pipe, plates.
- DN above those given in the table

ACTUATOR:

- Handwheel
- Stem
- Nut
- Stem protection bonnet

AVAILABLE:

- DN80 to DN900.

From ND200 the drive is with a Gear-box.

* Other ND on request.

• Other pressures on request

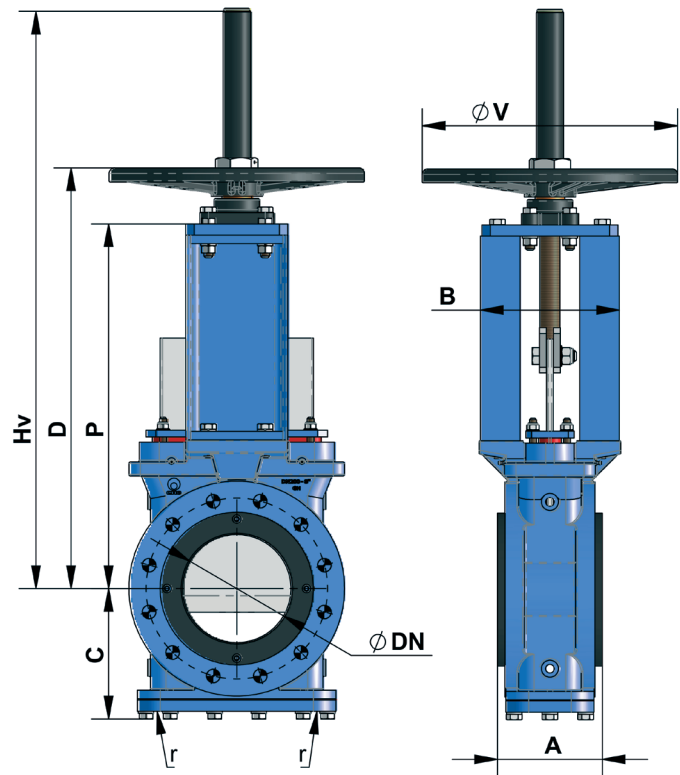


Fig. 14

DN	A	B	C	P	D	Hv	ϕV	r (B.S.P.)
80	175	110	125	364	401	529	225	1/4"
100	175	110	155	420	457	635	225	1/4"
150	178	126	198	529	582	823	325	1/4"
200	185	250	223	645	729	1024	--	3/8"
250	226	260	279	733	817	1142	--	1/2"
300	258	275	296	832	916	1361	--	1/2"
350	258	290	347	934	1036	1435	--	1/2"
400	279	320	376	1087	1189	1688	--	3/4"
450	321	350	401	1220	1456	1919	--	3/4"
500	367	350	436	1326	1562	2100	--	3/4"
600	371	350	515	1507	1817	2426	--	1"
750	413	375	625	1779	--	--	--	1"
900	472	400	710	2050	--	--	--	1"

Table 4

GEAR-BOX

The definition variables are as follows:

B = Max. width of the valve (without drive).

P = Max. height of the valve (without drive).

OPTIONS:

- Chainwheel.
- Locking devices.
- Extensions: stand, pipe, plates...
- DN higher than those give in the table.

ACTUATOR:

- Yoke
- Stem
- Tapered gear
- Handwheel
- Stem protection bonnet

DISPONIBLE:

- DN80 to DN900

* Other ND on request.

• Other pressures on request

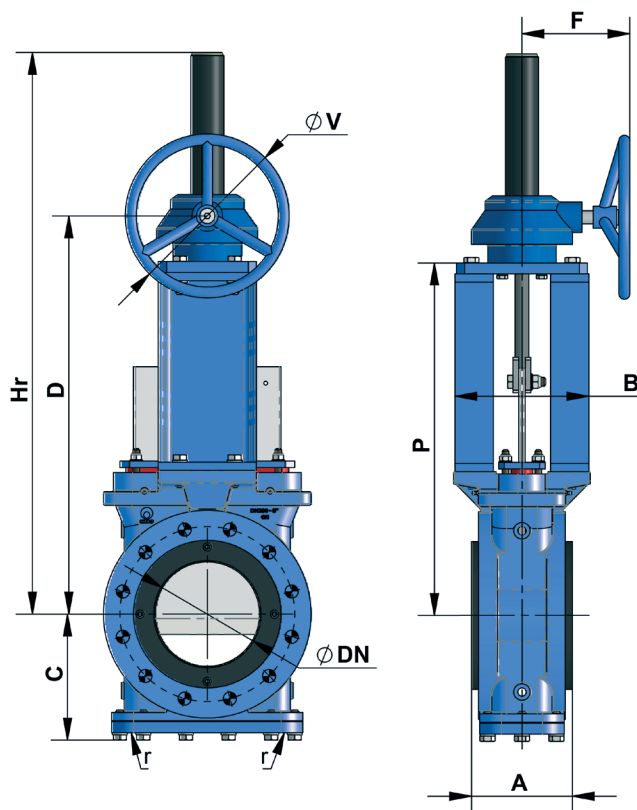


Fig. 15

DN	A	B	C	P	D	Hr	F	$\varnothing V$	r (B.S.P.)
80	175	110	125	364	484	634	198	300	1/4"
100	175	110	155	420	540	690	198	300	1/4"
150	178	126	198	529	653	878	198	300	1/4"
200	185	250	223	645	729	1024	198	300	3/8"
250	226	260	279	733	817	1142	198	300	1/2"
300	258	275	296	832	916	1361	218	450	1/2"
350	258	290	347	934	1036	1435	288	650	1/2"
400	279	320	376	1087	1189	1688	313	850	3/4"
450	321	350	401	1220	1456	1919	392	450	3/4"
500	367	350	436	1326	1562	2100	392	450	3/4"
600	371	350	515	1507	1817	2426	442	650	1"
750	413	375	625	1779	--	--	--	--	1"
900	472	400	710	2050	--	--	--	--	1"

Table 5

DOUBLE-ACTING PNEUMATIC CYLINDER

The definition variables are as follows:

B = Max. width of the valve (without drive).

P = Max. height of the valve (without drive).

The air supply pressure to the cylinder is a minimum of 6 bar and a maximum of 10 bar, the air must be dry and lubricated.

If the air pressure is less than 6 bar, consult **CMO Valves**.

For DN80 to DN100 valves, the cylinder's jacket and covers are made of aluminum, the rod of AISI304, the piston of rubber-coated steel and the O-ring seals are made of nitrile.

For pneumatic cylinders larger than $\varnothing 200$ the covers are made of nodular cast iron or carbon steel.

On request, we can also supply the actuator made entirely of stainless steel, especially for installation in corrosive atmospheres.

AVAILABLE:

- DN80 to DN450.

* Other ND on request.

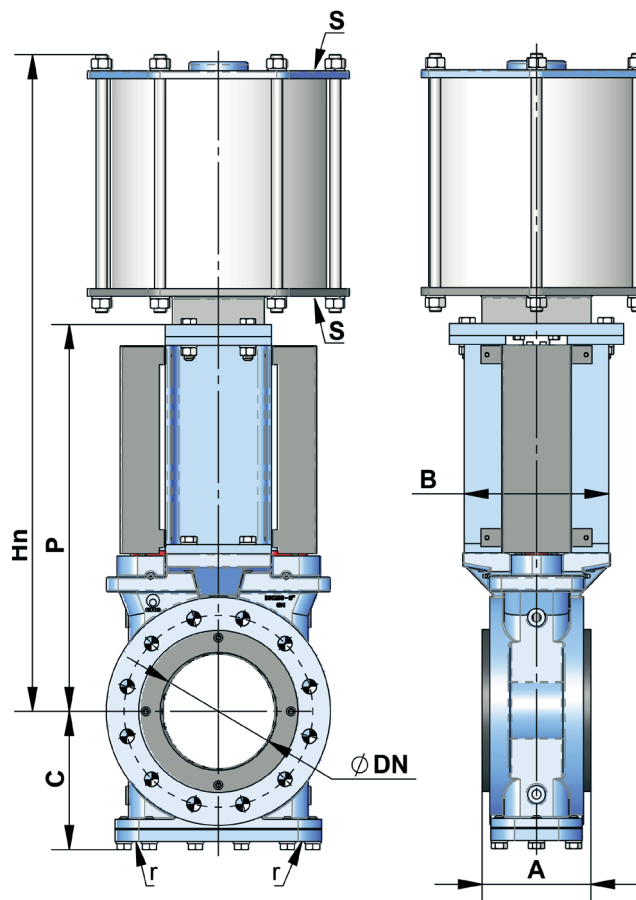


Fig. 16

DN	A	B	C	P	Hn	J	øCIL	Ø ROD	r (B.S.P.)	S (B.S.P.)
80	175	110	125	364	594	138	125	25	1/4"	1/4"
100	175	110	155	420	682	175	160	30	1/4"	1/4"
150	178	126	198	529	920	270	250	40	1/4"	3/8"
200	185	250	223	645	1095	444	350	45	3/8"	1/2"
250	226	260	279	735	1276	508	400	50	1/2"	1/2"
300	258	275	296	832	1429	612	500	50	1/2"	3/4"
350	258	290	347	934	1572	612	500	50	1/2"	3/4"
400	279	320	376	1087	1802	772	585	60	3/4"	1"
450	321	350	401	1220	2032	772	635	70	3/4"	1"

Table 6

ELECTRIC ACTUATOR

This actuator is automatic and includes the following parts:

- Electric motor.
- Stem.
- Yoke.

OPTIONS:

- Different types and brands
- ISO 5210 / DIN 3338 Flanges

AVAILABLE:

- DN 80 to DN 900

* Other ND on request.

From DN200 (inclusive) the motor is assisted with a gear box

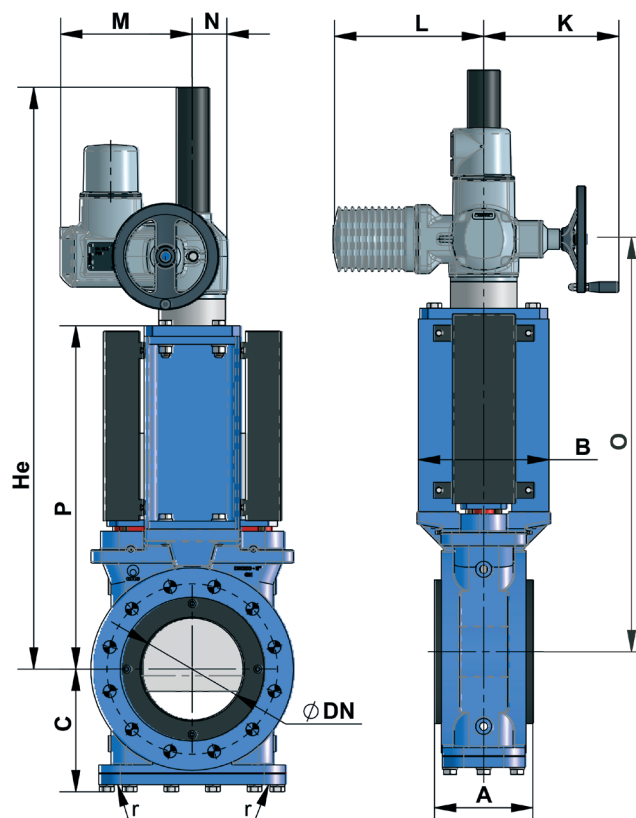


Fig. 17

DN	A	B	C	P	K	L	M	O	He	r (B.S.P.)
80	175	110	125	364	249	264	238	528	738	1/4"
100	175	110	155	420	249	264	238	584	794	1/4"
150	178	126	198	529	249	264	238	697	907	1/4"
200	185	250	223	645	249	264	424	769	1024	3/8"
250	226	260	279	733	254	282	424	867	1142	1/2"
300	258	275	296	832	254	282	424	966	1361	1/2"
350	258	290	347	934	336	388	479	1103	1435	1/2"
400	279	320	376	1087	336	388	479	1256	1688	3/4"
450	321	350	401	1220	254	282	600	1456	1919	3/4"
500	367	350	436	1326	254	282	600	1512	2100	3/4"
600	371	350	515	1507	336	388	656	1714	2426	1"
750	413	375	625	1779	336	388	663	2156	2712	1"
900	472	400	710	2050	339	388	731	2409	3155	1"

Table 7

HYDRAULIC ACTUATOR

The definition variables are as follows:

B = Max. width of the valve (without drive).

P = Max. height of the valve (without drive).

THE HYDRAULIC ACTUATOR INCLUDES:

- Hydraulic cylinder
- Yoke

SUPPLY PRESSURE STANDARD:

- 135 bar.

AVAILABLE:

- DN 80 to DN 900

* Other ND on request.

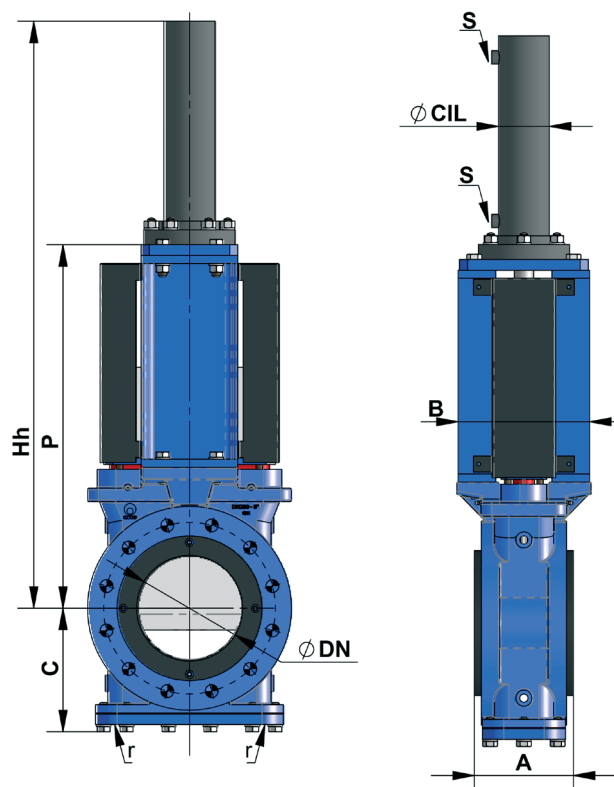


Fig. 18

DN	A	B	C	P	Hh	$\varnothing CIL$	$\varnothing ROD$	S (B.S.P.)	OIL CAP. (dm ³)	r (B.S.P.)
80	175	110	125	364	604	40	22	3/8"	0,1	1/4"
100	175	110	155	420	642	40	22	3/8"	0,2	1/4"
150	178	126	198	529	870	63	36	3/8"	0,6	1/4"
200	185	250	223	645	1060	80	36	3/8"	1,2	3/8"
250	226	260	279	733	1168	100	56	1/2"	2,5	1/2"
300	258	275	296	832	1384	125	56	1/2"	4,5	1/2"
350	258	290	347	934	1551	125	56	1/2"	5	1/2"
400	279	320	376	1087	1710	160	70	1/2"	9,1	3/4"
450	321	350	401	1220	1890	160	70	1/2"	10,5	3/4"
500	367	350	436	1326	2219	200	70	1/2"	18,5	3/4"
600	371	350	515	1507	2510	200	70	1/2"	21	1"
750	413	375	625	1779	2892	--	--	--	--	1"
900	472	400	710	2050	3343	--	--	--	--	1"

Table 8

FLANGE DIMENSIONS

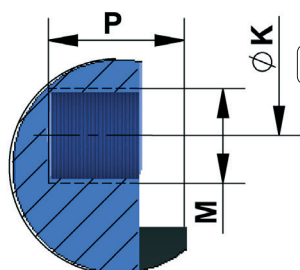
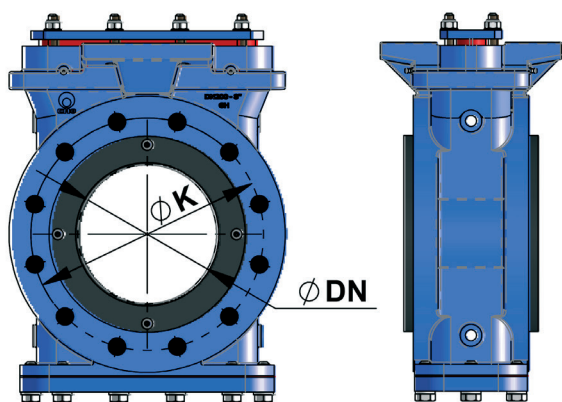


Fig. 19

● TAPPED HOLE

EN 1092-2 PN25

DN	ΔP (bar)	●	M (Metric)	P	ØK
80	25	8	M 16	29	160
100	25	8	M 20	32	190
150	25	8	M 24	36	250
200	25	12	M 24	36	310
250	25	12	M 27	38	370
300	25	16	M 27	38	430
350	25	16	M 30	40	490
400	25	16	M 33	44	550
450	25	20	M 33	50	600
500	25	20	M 33	50	660
600	25	20	M 36	50	770
750	25	--	--	--	--
900	25	28	M45	63	1090

Table 9

EN 1092-2 PN40

DN	ΔP (bar)	●	M (Metric)	P	ØK
80	40	8	M 16	29	160
100	40	8	M 20	32	190
150	40	8	M 24	36	250
200	40	12	M 27	36	320
250	40	12	M 30	38	385
300	40	16	M 30	38	450
350	40	16	M 33	40	510
400	40	16	M 36	44	585
450	40	20	M 36	50	610
500	40	20	M 39	50	670
600	40	20	M 45	50	795
750	40	--	--	--	--
900	40	--	--	--	--

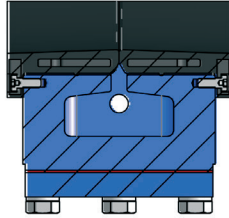
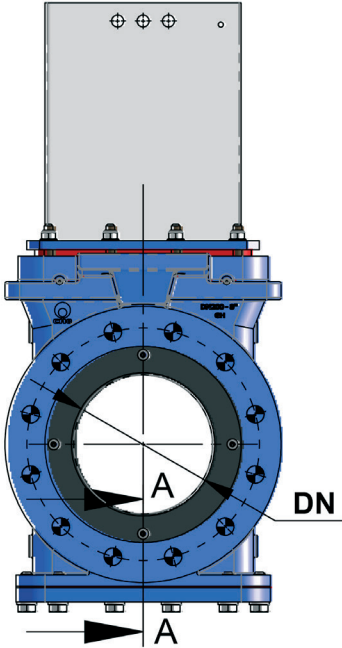
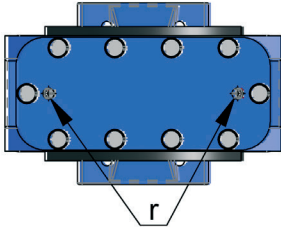
Table 10

ANSI B16.5, class 300

DN	ΔP (psi)	●	M (UNC)	P	ØK
3"	300	8	3/4"	1,14"	6,63"
4"	300	8	3/4"	1,26"	7,87"
6"	300	12	3/4"	1,42"	10,63"
8"	300	12	7/8"	1,42"	13"
10"	300	16	1"	1,5"	15,25"
12"	300	16	1 1/8"	1,5"	17,75"
14"	300	20	1 1/8"	1,57"	20,25"
16"	300	20	1 1/4"	1,73"	22,5"
18"	300	24	1 1/4"	1,97"	24,75"
20"	300	24	1 1/4"	1,97"	27"
24"	300	24	1 1/2"	1,97"	32"
30"	300	28	1 3/4"	2,24"	39,25"
36"	300	32	2"	2,48"	46"

Table 11

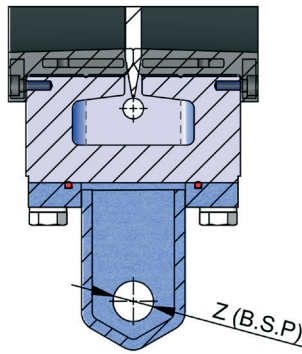
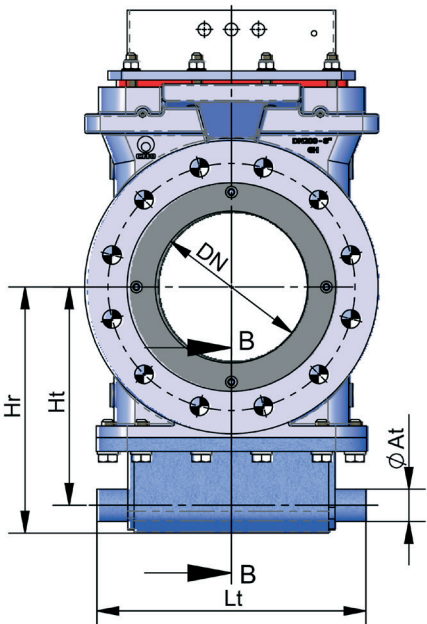
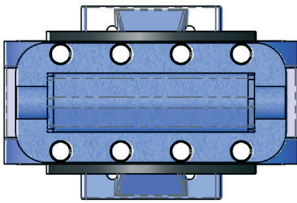
STANDARD VERSION



SECCIÓN A-A

DN	r (B.S.P.)
80	1/4"
100	1/4"
150	1/4"
200	3/8"
250	1/2"
300	1/2"
350	1/2"
400	3/4"
450	3/4"
500	3/4"
600	1"

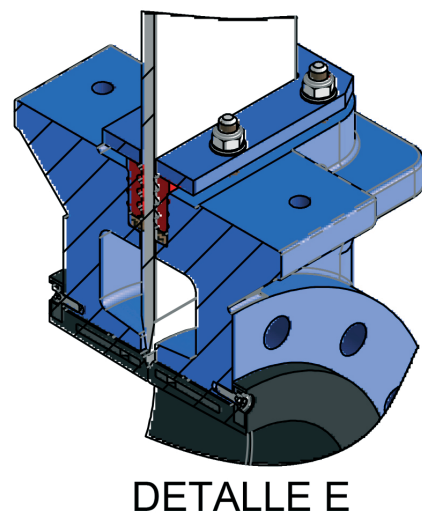
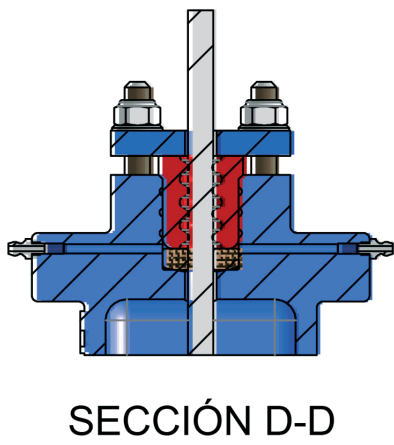
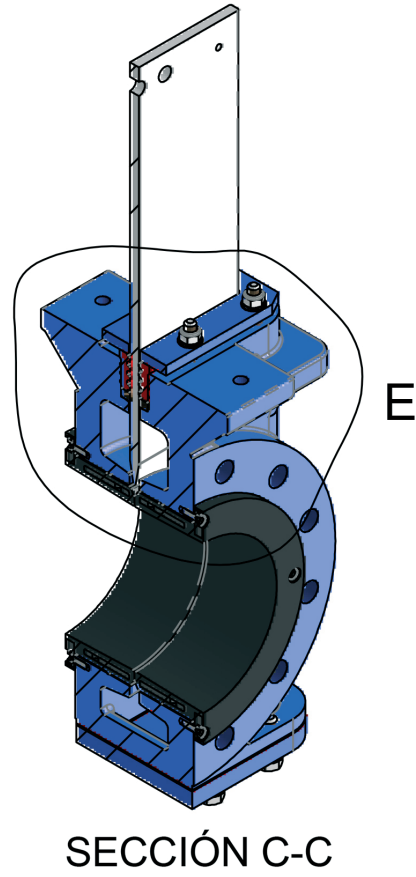
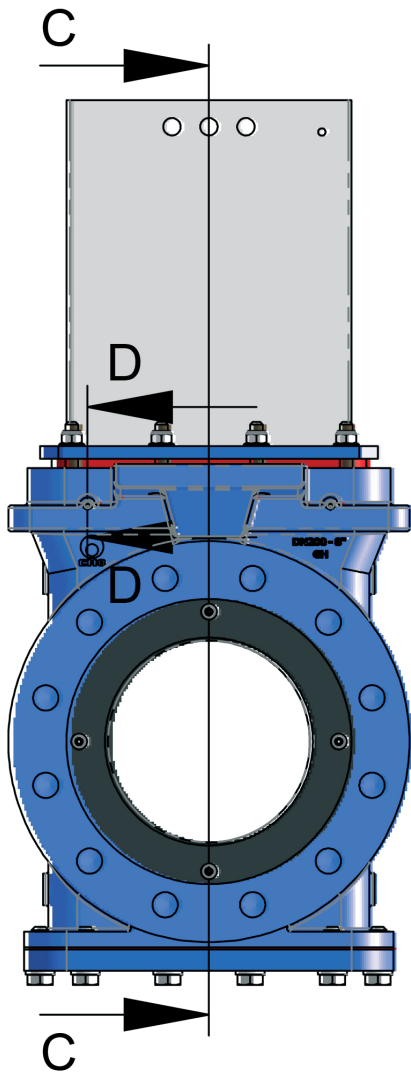
Table 12



SECCIÓN B-B

DN	Ht	Lt	At	Hr	z (B.S.P.)
80	174	220	42	224	1"
100	188	240	42	245	1"
150	223	290	42	283	1"
200	272	350	62	315	1 3/4"
250	310	400	62	368	1 3/4"
300	348	450	62	393	1 3/4"
350	373	520	62	446	1 3/4"
400	403	560	62	472	1 3/4"
450	428	610	62	495	1 3/4"
500	472	690	70	530	2"
600	542	790	70	603	2"

Table 13





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