DNS - Directional control valve

Before use, carefully read the GENERAL INSTRUCTIONS FOR USE OF DIRECTIONAL CONTROL VALVES

Nominal flow	**45 l/min** ***11.9 US gpm***
Nominal pressure	**300 bar** ***4350 psi***
Maximum tank pressure	**50 bar** ***725 psi***
Maximum internal leakage (A or B -> P and T) p=100 bar (1450 psi)	**8 cm³/min** ***0.49 in³/min***
Temperature range	**-20°C +85°C NBR seals** ***(max peak +100°C)*** ***-20°C + 130°C HNBR seals***
Oil viscosity	**from 15 mm²/s to 90 mm²/s** ***(15 cSt to 90 cSt)***
Fluid	**Hydraulic fluids as defined in ISO 6743-4 standard**

STANDARD version

Section

Dimensions

Standard

Dimensions per number of sections

Code	N° of sections	L		Weight	
		mm	in	kg	lb
2	2	111	4,37	5,0	11,0
3	3	151	5,94	7,3	16
4	4	191	7,52	9,4	20,7
5	5	231	9,1	11.5	25,3
6	6	271	10,67	13,6	30

Pressure drops P-T

Testing parameters: Spool type **01**

Pressure drops P-A

Testing parameters: Spool type **01**

Pressure drops B1-T

Testing parameters: Spool type **01**

Metering

Testing parameters: Spool type **01**

VNR - Check valve

The VNR is a check valve on line P which prevents the flow going from the downstream section to the upstream one. The VNR will always be located between the last two sections of the directional control valve.

2 section directional control valve

3 section directional control valve

A Power unit

This option is used when you want electro-hydraulic or just hydraulic actuation of the directional control valve. With this option, the electro-hydraulic kit will not be supplied with connecting pipes.

Type of inlet

S Left (standard)

D Right

Port A is usually the nearest port to the actuator side.

Thread ports

Thread ports P - P1

Code	Type	Torque Nm
0	Not processed	
L	1/4'' GAS ISO 1179	28
A	3/8'' GAS ISO 1179	40
B	1/2'' GAS ISO 1179	65
3	M14x1.5 ISO 9974	10
T	M16x1.5 ISO 9974	28
C	M18x1.5 ISO 9974	42
I	M16x1.5 ISO 6149	28
W	M18x1.5 ISO 6149	28
P	9/16'' - 18 SAE ISO 11926	28
E	3/4'' - 16 SAE ISO 11926	42

Thread ports A - B

Code	Type	Torque Nm
L	1/4'' GAS ISO 1179	28
A	3/8'' GAS ISO 1179	40
B	1/2'' GAS ISO 1179	65
T	M16x1.5 ISO 9974	28
C	M18x1.5 ISO 9974	42
I	M16x1.5 ISO 6149	28
W	M18x1.5 ISO 6149	28
P	9/16'' - 18 SAE ISO 11926	28
E	3/4'' - 16 SAE ISO 11926	42

Thread Port T

Code	Type	Torque Nm
B	1/2'' GAS ISO 1179	65
N	M22x1.5 ISO 9974	67
J	M22x1.5 ISO 6149	67
R	7/8'' - 14 SAE ISO 11926	67

Thread port T1

Code	Type	Torque Nm
0	Not processed	
L	1/4'' GAS ISO 1179	28
A	3/8'' GAS ISO 1179	40
B	1/2'' GAS ISO 1179	65
3	M14x1.5 ISO 9974	10
T	M16x1.5 ISO 9974	28
C	M18x1.5 ISO 9974	42
I	M16x1.5 ISO 6149	28
W	M18x1.5 ISO 6149	28
P	9/16'' - 18 SAE ISO 11926	28
E	3/4'' - 16 SAE ISO 11926	42

L Standard kit for lever holder

Z Lever holder with stroke limiter

A Without lever holder, standard appendix

T Cable setting

M Joystick

a=Spool 1st section b=Spool 2nd section

G Joystick with spool lock

Joystick functions

Also available in other configurations.

K Hydraulic control

Hydraulic control

P Pneumatic

a = Large chamber b = Small chamber

The pneumatic actuator is located on the side where the spool control is normally placed and is the main actuator. The directional control valve will also be supplied as standard with the lever holder on the opposite side.

Pneumatic control

a = Large chamber b = Small chamber

H Dual effect

a = Large chamber b = Small chamber

S Simple effect port A

b = Small chamber

X Simple effect port B

a = Large chamber

Electro-hydraulic control

a = Large chamber b = Small chamber

U Dual effect

a = Large chamber b = Small chamber

I Simple effect port A

b = Small chamber

W Simple effect port B

a = Large chamber

Electro-pneumatic control

a = Large chamber b = Small chamber

Spool types

01 Spool type

Positions

3	1	0	2	4
	P → B A → T BP ⊣	P, T ⊣ A, B ⊣ BP →	P → A B → T BP ⊣	

03 Spool type

Positions

3	1	0	2	4
	P → B A → T BP ⊣	A, B → T P ⊣ BP →	P → A B → T BP ⊣	

04 Spool type

Positions

3	1	0	2	4
	A → T P, B ⊣ BP →	P, T ⊣ A, B ⊣ BP →	P → A B, T ⊣ BP ⊣	

05 Spool type

Positions

3	1	0	2	4
	P → B A, T ⊣ BP ⊣	P, T ⊣ A, B ⊣ BP →	P, A ⊣ B → T BP →	

07 Spool type

Positions

3	1	0	2	4
A, B → T P ⊣ BP →	P → B A → T BP ⊣	P, T ⊣ A, B ⊣ BP →	P → A B → T BP ⊣	

08 Spool type

Positions

3	1	0	2	4
	P → B A → T BP ⊣	A → T P, B ⊣ BP →	P → A B → T BP ⊣	

10 Spool type

Positions

3	1	0	2	4
	P → B A → T BP ┤	B → T P, A ┤ BP →	P → A B → T BP ┤	

17 Spool type

Positions

3	1	0	2	4
	P → B A → T BP ┤	P, T ┤ A, B ┤ BP →	P → A B → T BP ┤	P → A, B T ┤ BP ┤

23 Spool type

Positions

3	1	0	2	4
	P → B A → T BP ┤	P, T ┤ A, B ┤ BP →	P → A, B T ┤ BP ┤	P → A B → T BP ┤

70 Spool type

Positions

3	1	0	2	4
	P → B A → T BP ┤	P, T ┤ A, B ┤ BP →	P → A B → T BP ┤	A, B → T P ┤ BP →

0A

Neutral position in 0

0B

Neutral position in 0, detent in 1

0C

Neutral position in 0, detent in 2

0D

Detent in 0, 1, 2

0E

Neutral position in 0

0F

Neutral position in 0

0H

Detent in 2

0L

Detent in 1

0Q

Detent in 1, 2

0R

Neutral position in 2

0S

Neutral position in 1

NS

Neutral position in 0, detent in 3

NT

Neutral position in 0, detent in 4

PS

Detent in 3, 1, 0, 2

TR

Neutral position in 1

VL Pressure limiter device valve port A and B

To select pressure limiter device valves, the directional control valve must have at least 3 sections.

Valve type port A - B

VB Pilot operated check valve port A and B

To select check valves, the directional control valve must have at least 3 sections.

Straight standard knob

Code	Description	h [mm]	h [in]
A	Straight standard knob	109	4,3
B	Straight standard knob	134	5.28
C	Straight standard knob	184	7,24
D	Straight standard knob	214	8,42
E	Straight standard knob	254	10
F	Straight standard knob	304	11,97

Ergonomic lever

Code	Description	h [mm]	h [in]
L	Straight vertical	180	7.09
O	Bent 15° vertical	180	7.09
R	Bent 30° vertical	180	7.09
M	Straight horizontal	180	7.09
Y	Bent 15° horizontal	180	7.09
Q	Bent 30° horizontal	180	7.09

Lever holder position

A Straight

C Rotated 180°

D Rotated 90° towards T

Options spool control side

C Stroke limiter

M Male dual control

T Cable fitting

Microswitch

Characteristics of microswitch positioner

Contact rating	16(5)A at 250V A.C 50 Hz 3A at 30V D.C. L/R= 5 ms
Temperature range	-20° to 85° C
Expected mechanical life	10 million cycles at 1 Hz
Insulation	Up to 100 MΩ

Y Dual effect microswitch

P Simple effect microswitch port A

O Simple effect microswitch port B

A Carry-over option

B With carry-over port T

Instructions for ordering

Repeat for each section of the valve

DNS	1	2	3	4	5	6	7 8	9	10	11	12 13	14	15 16

1 Spool types

2	Sections	**4**	Sections	**6**	Sections
3	Sections	**5**	Sections		

2 General options

N	None	**Z**	Zinc plating	**B**	Black painted and power supply
V	Black paint	**A**	Power unit	**E**	Zinc plating and power supply

3 Type of inlet

S	Left (standard)	**D**	Right

4 Thread port P

0	Not processed	**B**	1/2'' GAS ISO 1179	**C**	M18x1.5 ISO 9974	**P**	9/16'' - 18 SAE ISO 11926
L	1/4' GAS ISO 1179	**3**	M14x1.5 ISO 9974	**I**	M16x1.5 ISO 6149	**E**	3/4'' - 16 SAE ISO 11926
A	3/8'' GAS ISO 1179	**T**	M16x1.5 ISO 9974	**W**	M18x1.5 ISO 6149		

5 Thread port P1

0	Not processed	**B**	1/2'' GAS ISO 1179	**C**	M18x1.5 ISO 9974	**P**	9/16'' - 18 SAE ISO 11926
L	1/4' GAS ISO 1179	**3**	M14x1.5 ISO 9974	**I**	M16x1.5 ISO 6149	**E**	3/4'' - 16 SAE ISO 11926
A	3/8'' GAS ISO 1179	**T**	M16x1.5 ISO 9974	**W**	M18x1.5 ISO 6149		

6 Options on port P-P1

A	P open - P1 open (standard)	**C**	P plugged - P1 open	**E**	P not processed - P1 open
B	P open - P1 plugged	**D**	P open - P1 not processed		

7 8 Maximum pressure relief valve type

00	VMP replacement plug	**12**	120 bar	**19**	190 bar	**26**	260 bar
06	60 bar	**13**	130 bar	**20**	200 bar	**27**	270 bar
07	70 bar	**14**	140 bar	**21**	210 bar	**28**	280 bar
08	80 bar	**15**	150 bar	**22**	220 bar	**29**	290 bar
09	90 bar	**16**	160 bar	**23**	230 bar	**30**	300 bar
10	100 bar	**17**	170 bar	**24**	240 bar		
11	110 bar	**18**	180 bar	**25**	250 bar		

9 Sealing type maximum pressure relief valve

G	Grub screw	**P**	Sealed	**N**	None
C	Cap	**R**	Sealing provided		

10 Thread ports A - B

L	1/4' GAS ISO 1179	**T**	M16x1.5 ISO 9974	**W**	M18x1.5 ISO 6149
A	3/8'' GAS ISO 1179	**C**	M18x1.5 ISO 9974	**P**	9/16'' - 18 SAE ISO 11926
B	1/2'' GAS ISO 1179	**I**	M16x1.5 ISO 6149	**E**	3/4'' - 16 SAE ISO 11926

11 Actuators

L	Standard kit for lever holder	**M**	Joystick	**H**	Dual effect electro-hydraulic control	**I**	Simple effect electro-pneumatic control port A
Z	Lever holder with stroke limiter	**G**	Joystick with spool lock	**S**	Simple effect electro-hydraulic control port A	**W**	Simple effect electro-pneumatic control port B
A	Without lever holder, standard appendix	**K**	Hydraulic control	**X**	Simple effect electro-hydraulic control port B		
T	Cable fitting on actuator side	**P**	Pneumatic	**U**	Dual effect electro-pneumatic control		

BONDIOLI & PAVESI DINOIL

Instructions for ordering

17	18	19	20	21	22	23	24	25	26	27	28

12 13

Spool types

01	Spool type	**05**	Spool type	**10**	Spool type	**70**	Spool type
03	Spool type	**07**	Spool type	**17**	Spool type		
04	Spool type	**08**	Spool type	**23**	Spool type		

14

Spool options

A	Standard spool 25-50 l/min	**C**	Nickel-plated spool 25-50 l/min	**N**	None
B	Standard spool 10-25 l/min	**D**	Nickel-plated spool 10-25 l/min		

15 16

Spool control

NN	None	**0E**	Neutral position in 0	**0R**	Neutral position in 2	**TR**	Neutral position in 1
0A	Neutral position in 0	**0F**	Neutral position in 0	**0S**	Neutral position in 1	**...**	
0B	Neutral position in 0, detent in 1	**0H**	Detent in 2	**NS**	Neutral position in 0, detent in 3	**...**	For selection, see the relevant chapter
0C	Neutral position in 0, detent in 2	**0L**	Detent in 1	**NT**	Neutral position in 0, detent in 4		
0D	Detent in 0, 1, 2	**0Q**	Detent in 1, 2	**PS**	Detent in 3, 1, 0, 2		

17 18

Valve type port A

00	None	**09**	VL 90 bar	**15**	VL 150 bar	**21**	VL 210 bar
TP	Processed and plugged	**10**	VL 100 bar	**16**	VL 160 bar	**22**	VL 220 bar
VB	Pilot operated check valve	**11**	VL 110 bar	**17**	VL 170 bar	**23**	VL 230 bar
06	VL 60 bar	**12**	VL 120 bar	**18**	VL 180 bar	**24**	VL 240 bar
07	VL 70 bar	**13**	VL 130 bar	**19**	VL 190 bar	**25**	VL 250 bar
08	VL 80 bar	**14**	VL 140 bar	**20**	VL 200 bar		

19 20

Valve type port B

00	None	**09**	VL 90 bar	**15**	VL 150 bar	**21**	VL 210 bar
TP	Processed and plugged	**10**	VL 100 bar	**16**	VL 160 bar	**22**	VL 220 bar
VB	Pilot operated check valve	**11**	VL 110 bar	**17**	VL 170 bar	**23**	VL 230 bar
06	VL 60 bar	**12**	VL 120 bar	**18**	VL 180 bar	**24**	VL 240 bar
07	VL 70 bar	**13**	VL 130 bar	**19**	VL 190 bar	**25**	VL 250 bar
08	VL 80 bar	**14**	VL 140 bar	**20**	VL 200 bar		

21

Lever options

N	None	**C**	h 184 mm / 7.24 in	**L**	Straight vertical	**Y**	Bent 15° horizontal
S	Without lever	**D**	h 214 mm / 8.42 in	**O**	Bent 15° vertical	**Q**	Bent 30° horizontal
A	h 109 mm / 4.3 in	**E**	h 254 mm / 10 in	**R**	Bent 30° vertical		
B	h 134 mm / 5.28 in	**F**	h 304 mm / 11.97 in	**M**	Straight horizontal		

22

Lever holder position

A	Straight	**C**	Rotated 180°	**N**	None
B	Rotated 90° towards P (right inlet)	**D**	Rotated 90° towards T		

23

Options spool control side

N	None	**M**	Male dual control	**Y**	Dual effect microswitch	**O**	Simple effect microswitch port B
C	Stroke limiter	**T**	Cable fitting	**P**	Simple effect microswitch port A		

24

Voltage and connector

N	None	**A**	12V DIN 43650	**B**	24V DIN 43650

25

Thread port T

B	1/2'' GAS ISO 1179	**N**	M22x1.5 ISO 9974	**J**	M22x1.5 ISO 6149	**R**	7/8'' - 14 SAE ISO 11926

26

Thread port T1

0	Not processed	**B**	1/2'' GAS ISO 1179	**C**	M18x1.5 ISO 9974	**P**	9/16'' - 18 SAE ISO 11926
L	1/4' GAS ISO 1179	**3**	M14x1.5 ISO 9974	**I**	M16x1.5 ISO 6149	**E**	3/4'' - 16 SAE ISO 11926
A	3/8'' GAS ISO 1179	**T**	M16x1.5 ISO 9974	**W**	M18x1.5 ISO 6149		

27

Options on port T-T1

A	T open - T1 open (standard)	**B**	T open - T1 plugged	**C**	T plugged - T1 open	**D**	T open - T1 not processed

28

Discharge options

A	Carry-over option (standard)	**B**	With carry-over port T