HIDROSIB

S.A.

193rd Stefan Cel Mare str., 2400 Sibiu -Romania

400 l/min	Hydraulic directional control valves Ng 20	FC - 4
315 bar		

GENERALITIES

Four-way 2 or 3 position (4/2 or 4/3) spool valves.

Direct operated:
- manually, by hand lever
- hydraulically, from a remote pilot source.

Pilot operated:
- solenoid piloted NG 10 valve
- air-piloted NG 10 valve

Spring or pressure returned to normal position. Indexable at manual operated valves.
Different control functions, obtained by different spools.
Subplate mounting conforming to ISO 4401 .

PERFORMANCE DATA

GENERAL

Fixing: face mounting

Mounting position: function 11: horizontally; all other functions: unrestricted.

Temperature range of ambient medium: -20°c.....+50°c

HIDRAULIC

Maximal pressure at ports P,A,B : 315 bar
Maximal pressure at port T : internal drain : 80 bar
external drain : 250 bar
Flow: see figures 1 and 2.

Fluid :
- Fluid type: additived mineral oil.
- Viscosity range : 10.....500 cSt
- Temperature range : -25°C.....+80°C
- Filtration : > 25 μm

SPECIFIC TO DMN VALVES

Handle operating force : 10 daNm

SPECIFIC TO DH VALVES

Pilot pressure : 3 ...315 bar
Shift volume : 10 cm^3

SPECIFICTO DPH VALVES

Main valve oil pilot pressure : 5 ... 210 bar
Pilot valve air pilot pressure : 2 ... 10 bar
Main valve oil shift volume : 10 cm^3
Pilot valve air shift volume : 2 cm^3
Main valve response time :

-shift in 15 ...120 ms^1
- shift out 50...80ms^1

Pilot valve response time :

- shift in 20 ...200 ms^1
- shift out 30 ...300 ms^1

SPECIFICTO DEH VALVES

Main valve pilot pressure : 5 ..... 315 bar
Main valve shift volume : 10 cm^3
Main valve response time :

-shift in 15 ...120 ms^1

- shift out 50...80ms^1

Pilot valve response time:

	CC DC	CA AC
- solenoid energized	65 ...100 ms^1	10 ...25 ms^1
	CC DC	CA AC
- no solenoid energized	30 ...300 ms^1	50 ...65 ms^1

SOLENOID CHARACTERISTICS

Type of current :	Direct curent (DC)	Alternating current (AC)
Voltage, Un	12 V 24 V 96 V 190 V	110 V/50Hz 220 V/50 Hz

Voltage admissible deviation : ±10%
Relative duty cycle : Da100%
Maximum switch frequency per hour : 3600
Power input at 20 ^{0}C :

cut-in	:	38 W	540VA
holding	:	38 W	80 VA

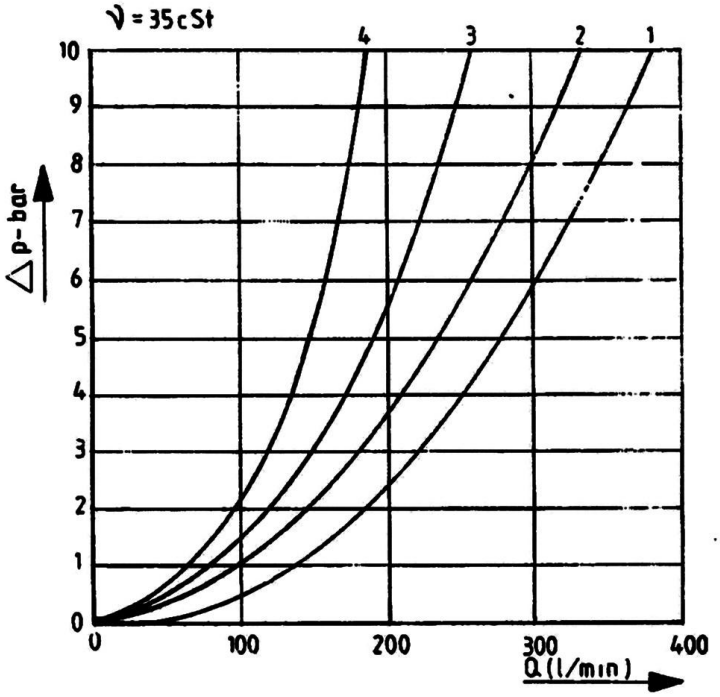
Type of connection: plug-in connector, , conforms to ISO 4400
Type of protection : IP 65 ; conforms to STAS 5325 (DIN 40050)

NOTE :

1 . Response time will vary with both with pilot pressure and pilot line length and width.

CHARACTERISTIC CURVES

Pressure drop vs. flow, $\Delta p = f(Q)$ for every kind of control



Spool type	Curve number				
	FA	PB	AT	BT	PT
06	1	1	2	2	
05	1	1	2	2	
04N	1	1	2	2	3
04	1	1	2	2	4
02	1	1	2	2	
09	1	1	2	2	
11	1	1	2	2	
01N	1	1	2	2	
01	1	1	2	2	
41	1			2	4
02D	1	1	2	2	
35	1	1	2		
45	1	1		2	

Fig. 1

Admissible flow vs. working pressure

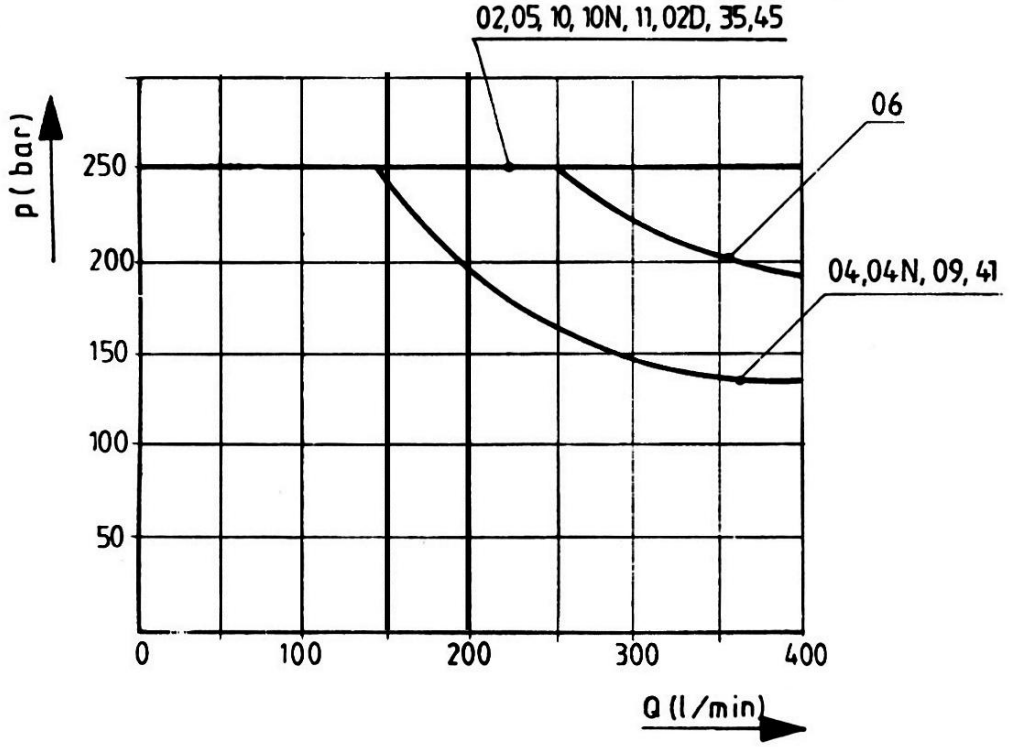


Fig. 2

Direct operated valves:

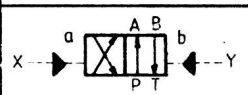
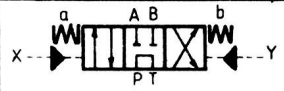
Spool type	Lap	Symbol	
		DH	DMN
01	+		
11	+		
02			
04	+		
04N	—		
05			
06			

Table 3

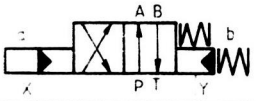
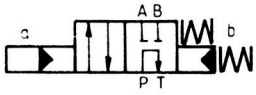
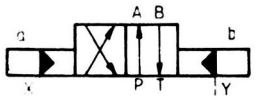
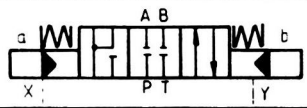
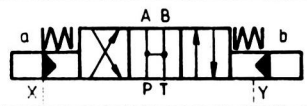
Pilot operated valves

Main valve actuated by NG 10 pilot valve oil pressure, with electrical control for DEH valves or air control - for DPH valves.

Oil supply for pilot valve can be effected directly from main valve P channel (internal control) or from an outer circuit, X (external control).

Table 4 includes - for each function - the available variants for control and drain. For additional options, it is required to get in touch with the manufacturer . Using internal control for functions which have P-T connection on medium position, or underlap at shifting in, is not advisable.

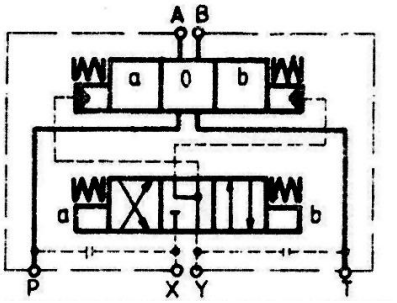
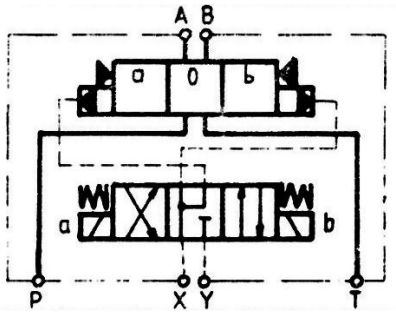
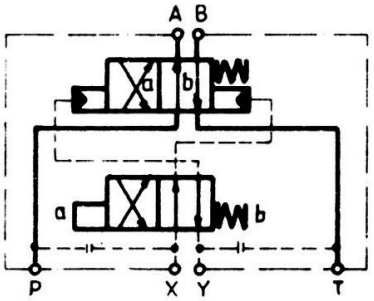
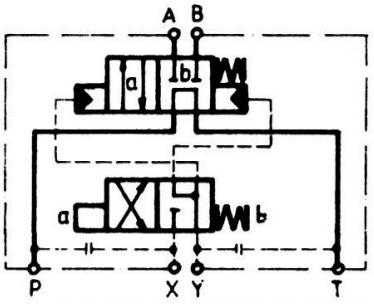
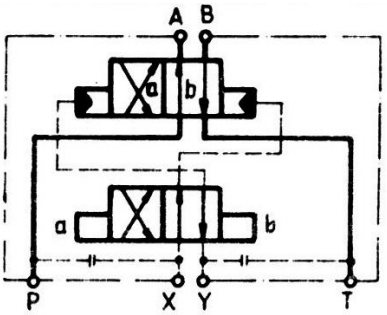
Table .4

Spool type	Simplified symbol	Lap	DEH						DPH
			Voltage						
			012/00	024/00 [3]	096/00	190/00	110/50	220/50 [3]	
01		+	PY	XY PT PY XT		XY PT	XY PY	XY PT PY	XY
01N		—	XY PY				XY	PY	
41		+	XT	XT				PY	
11		+	XY	XY PT PY				XY PT	XY
02				XY PT PY XT		XY PT	XY PY	XY PY	XY
02D				PT					
04		+	PY	PY				PY	
04N		—	XY PY	XY PY XT			XY PY	XY PY	XY
05				XY PT PY XT		PT	PT PY	XY PT PY	XY PT
35							XY	PY	
45				XY					
06			PY	XY PY	PY		PY	XY	
09				XY					

Regarding tables 3 and 4:

2. The lap during shifting represents the mode of effecting the connections between P,A,B,T channels during spool travel.
   Overlap (+) : During shiftingchannels don't intercommunicate
   Underlap (-) : During shifting channels intercommunicate.
3. Preffered

Tabel .5

Valve type	Spool type	Symbol	Remarks
4/3 spring return valve	02 02 D 04 04 N 05 35 45 06 09		
4/3 pressure return valve	02 .... H 02D...H 04 ...H 04N...H 05...H 35...H 45...H 06...H 09....H		Comanda si drenajul sunt numai externe(xy)
4/2 spring return valves	01 01 N		
	41		
4/2 no spring return valves	11		

SPECIAL EQUIPMENT

Directly hidraulically operated, DH type valves, have the ability to adjust spool stroke by means of adjusting screws located in the main valve side covers. Subsequently, for delivery purpose, model code should include mark C.

DEH and DPH valves are provided with:

-ability to adjust shifting time for 4/3 valves which operate at pilot pressures above 100 bar, means of a throttling plate mounted between main and pilot valves. Plate supplied alongwithvalve, by subsequently marking T in the model code. For the other valves, shifting time can be effected by using DR 1M-10-H-0 modular throttle valve, which is controlled individually. For further details, please see the catalog card regarding this item (FC-23).

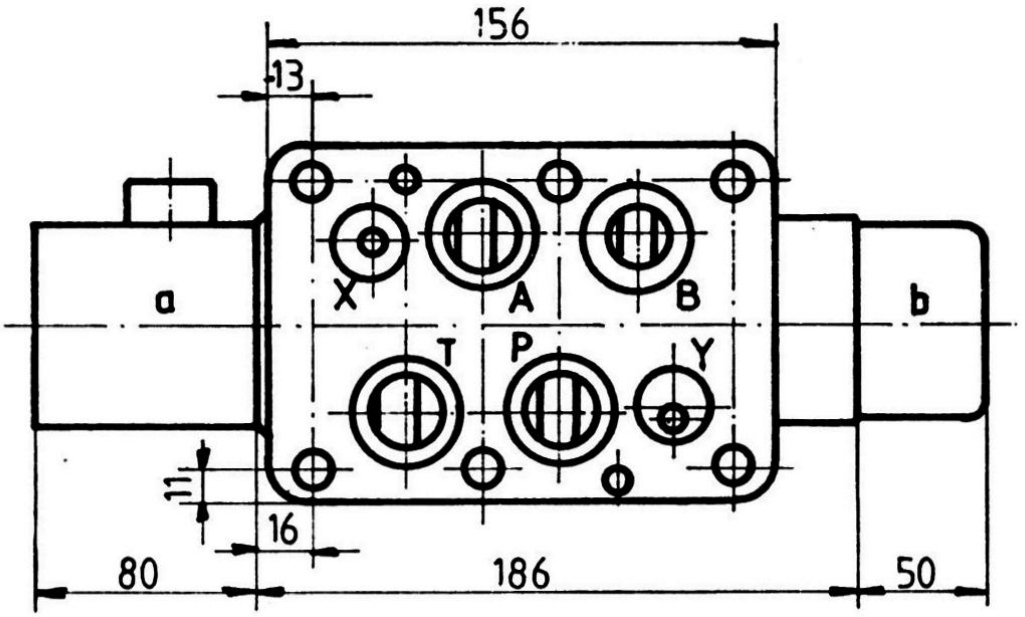
-ability to adjust main spool stroke, by means of adjusting screws located in main valve side covers. For delivery, model code should subsequently include mark C.

-ability to limit pilot flow for internally controlled valves, by mounting a nozzle inside the main valve body. For delivery, model code should subsequently include mark Z.

In case of being used for larger flows (i.e. above 300 l/min), 4/3 DEH valves are provided with the ability to center (return to center position) by pressure, using a special cover, mounted on the main valve.

Pilot pressure must be above 16 bar. For delivery, model code should subsequently include mark H.

DMN type, hand lever operated valves.



Weight : 19,6 kg

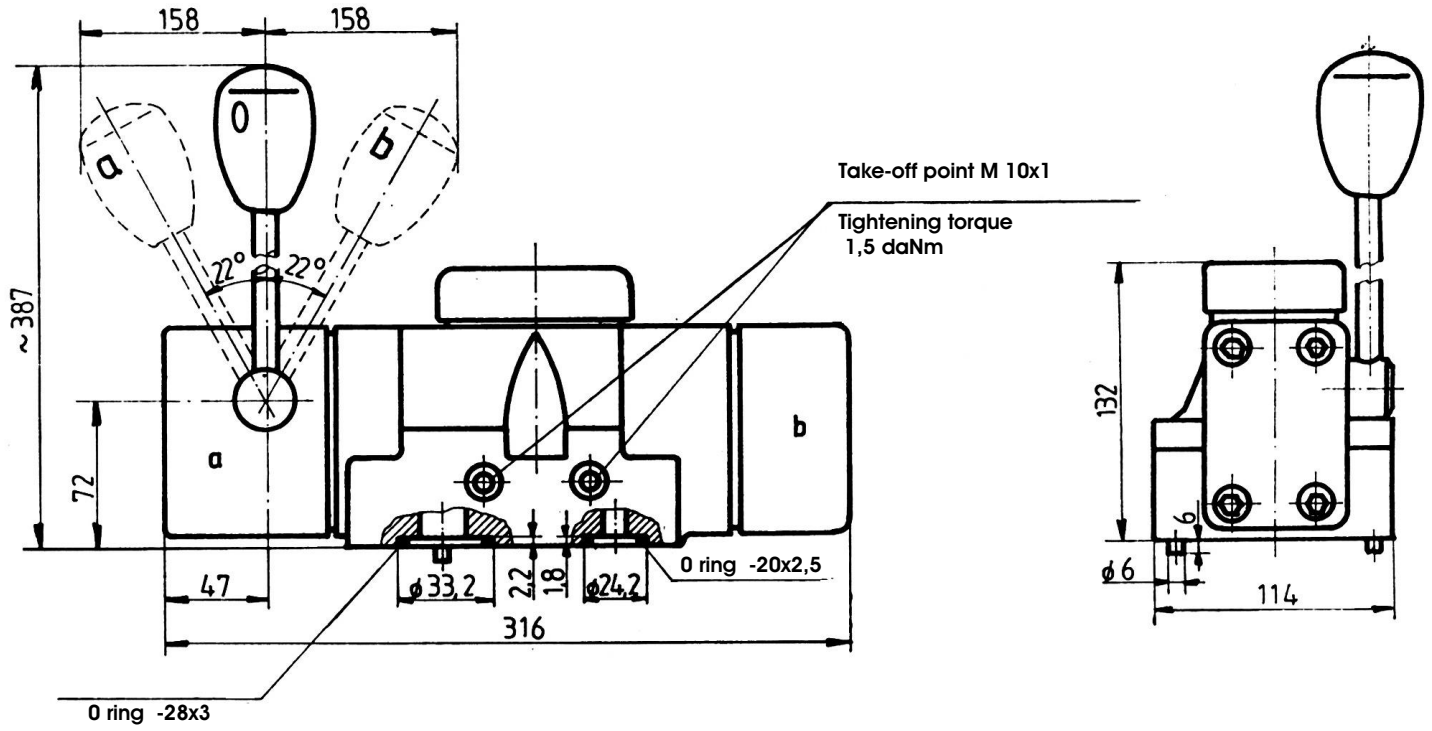
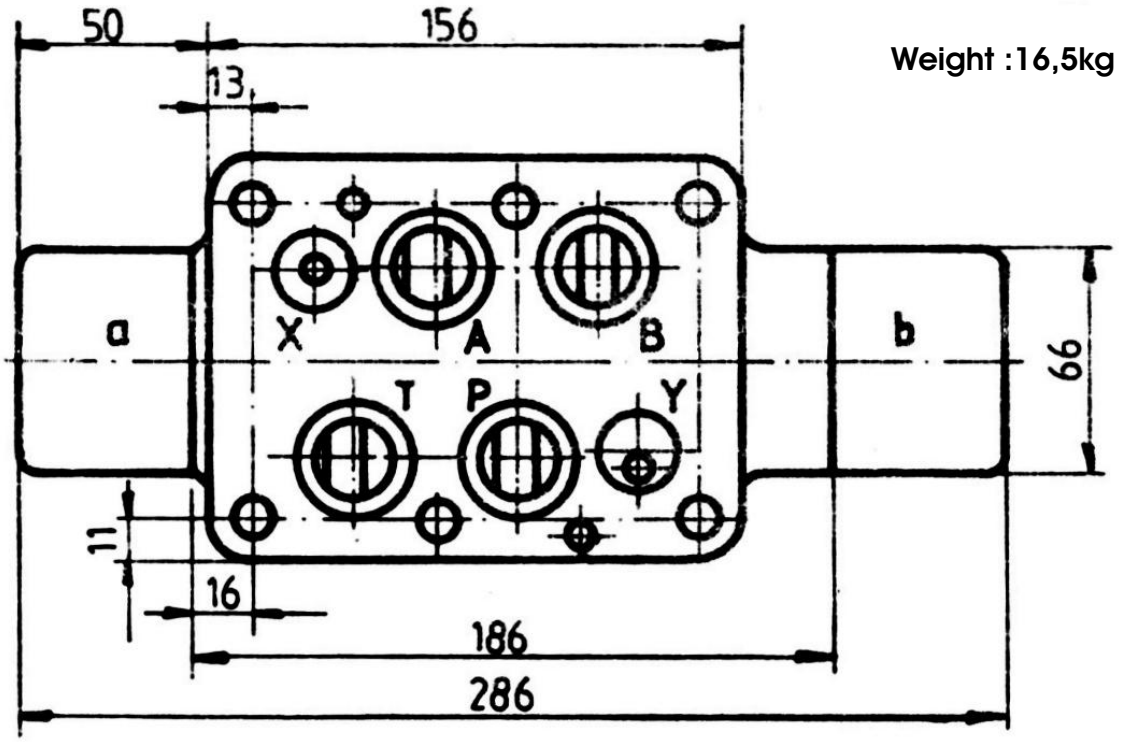
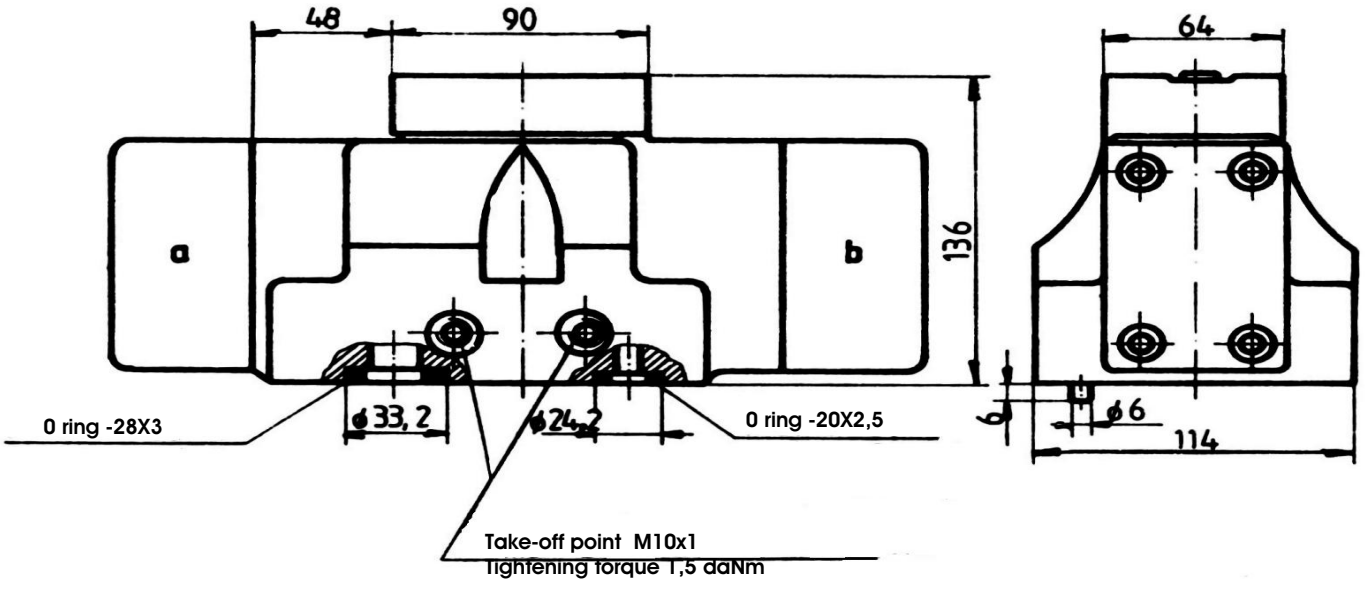


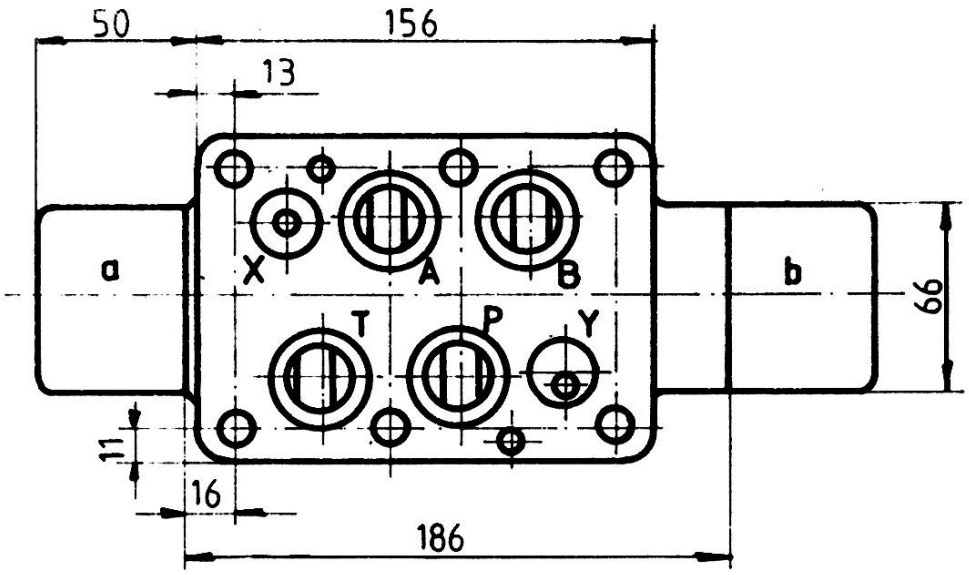
Fig. 3

DH type, direct oil operated valves.





DEH type, solenoid piloted valves



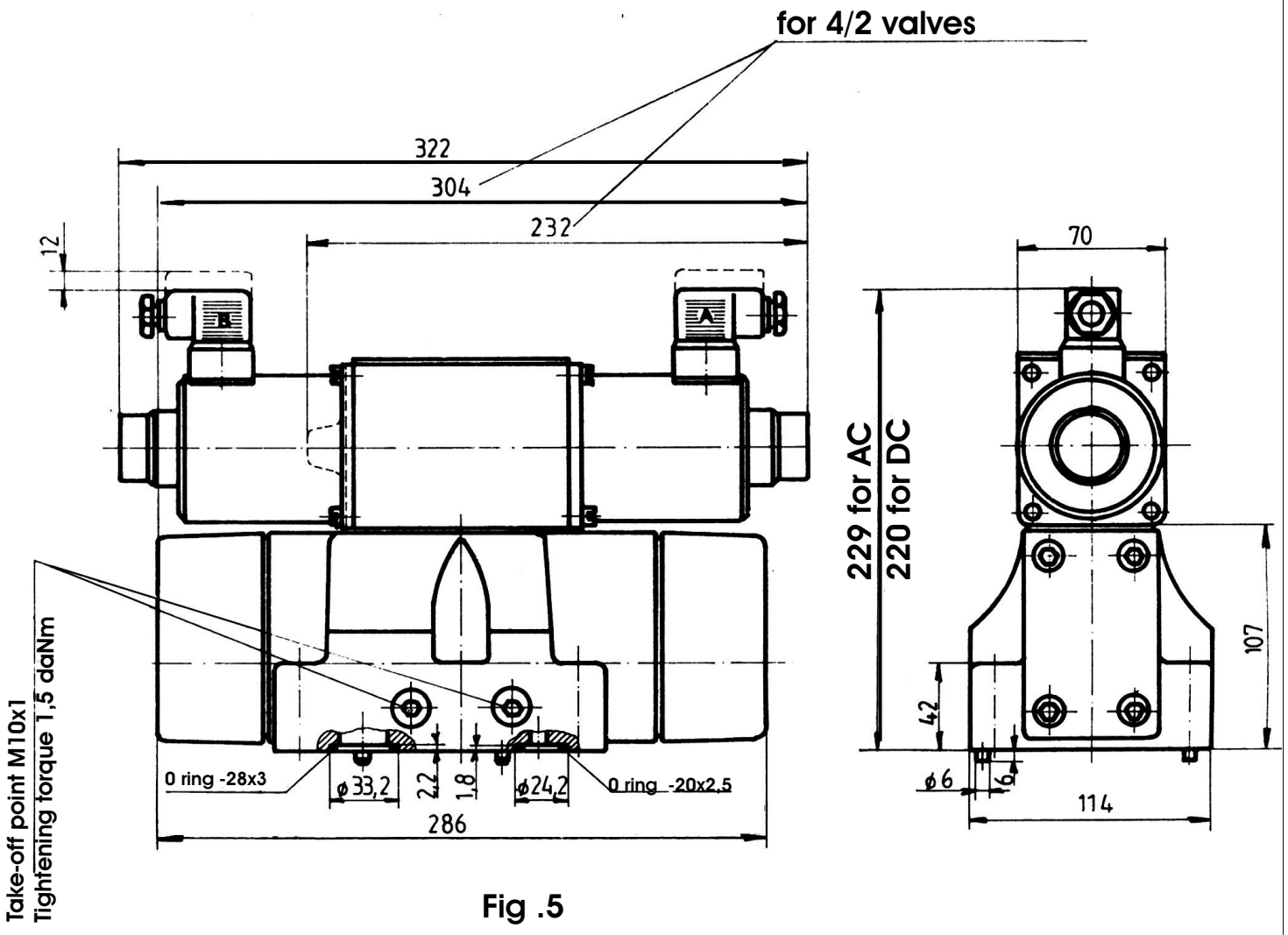


Fig .5

Weight	DC	AC
Single solenoid valves		
	18,0 kg	18,4 kg
Double solenoid valves	20,8kg	20,0kg

Pilot valve fixing screws tightening torque: $1,1^{+0,3}$ daNm.

DPH type,air-piloted valves

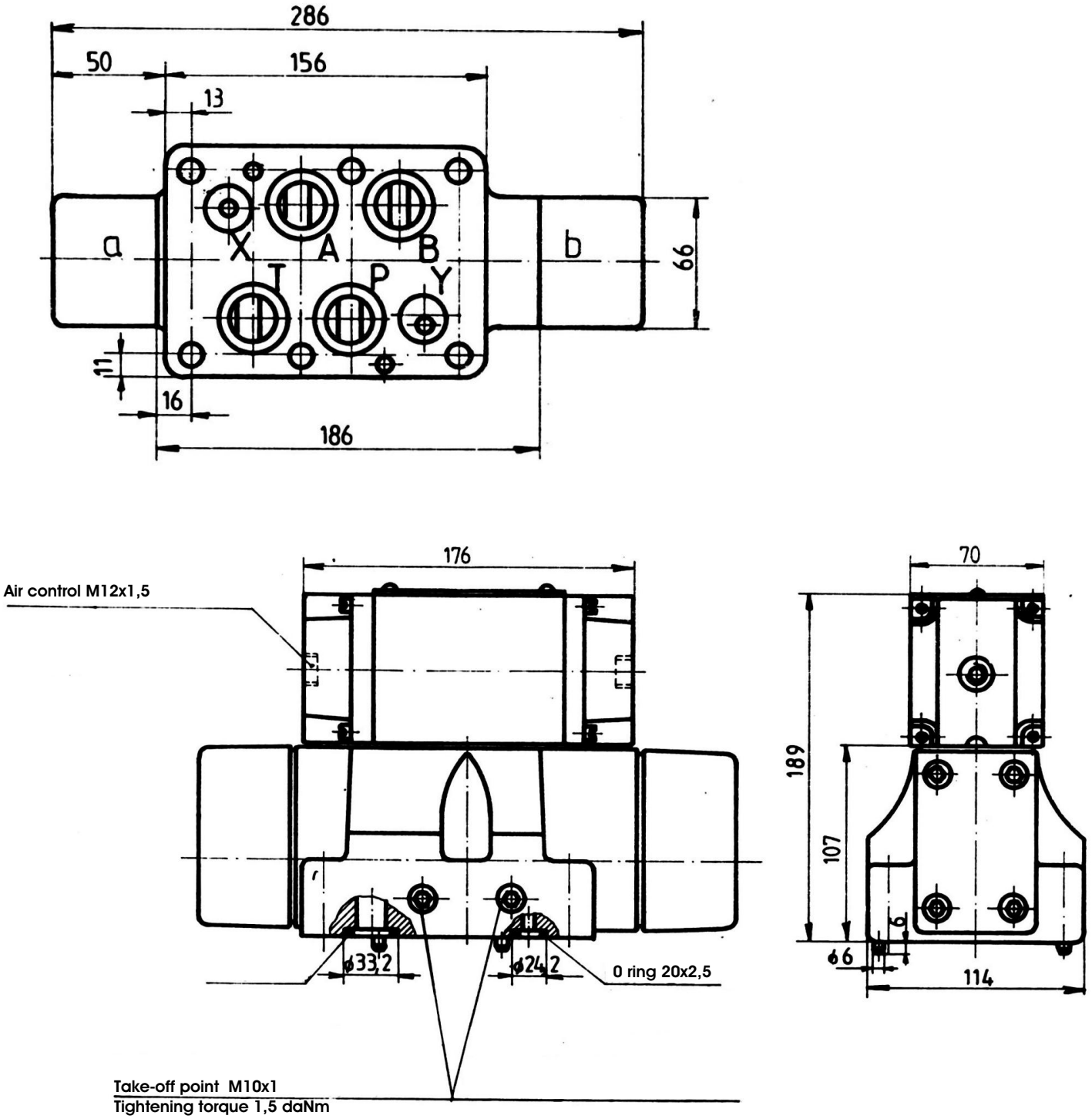


Fig. 6

Weight:
1 control-cover valves: 18,0 kg
2 control-cover valves: 18,5kg

Valves provided with special equipment
Adjustable shifting DEH and DPH valves

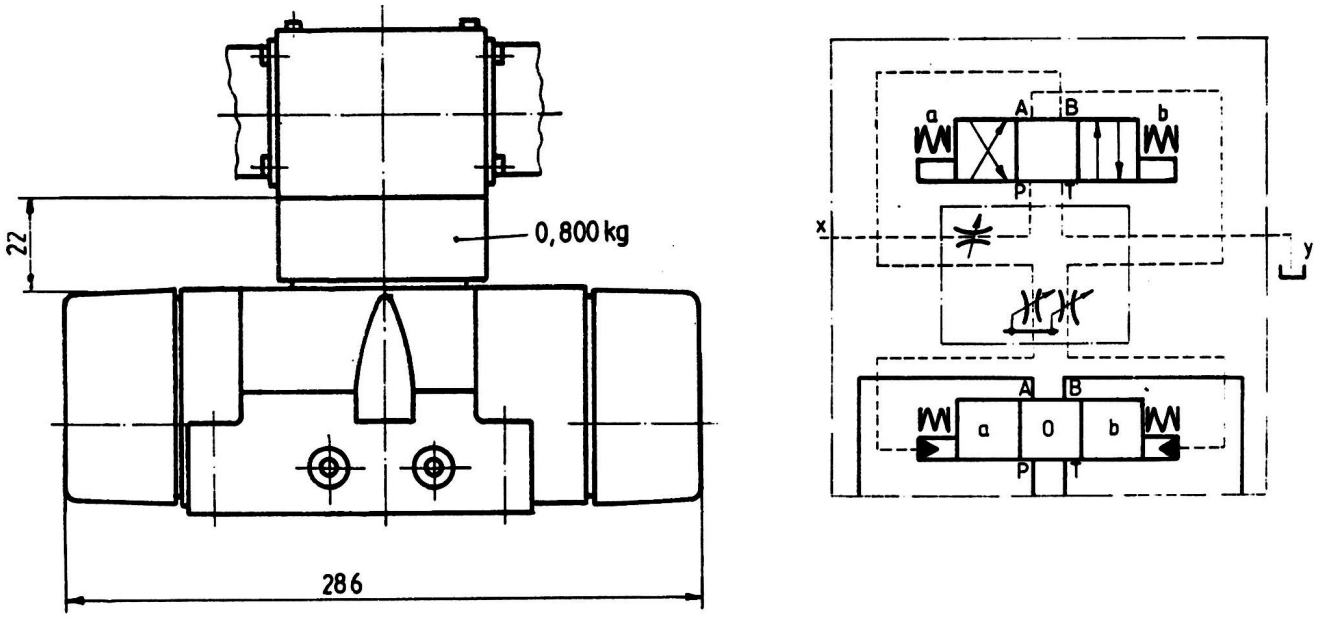


Fig.7

Adjustable spool stroke DH, DEH and DPH valves

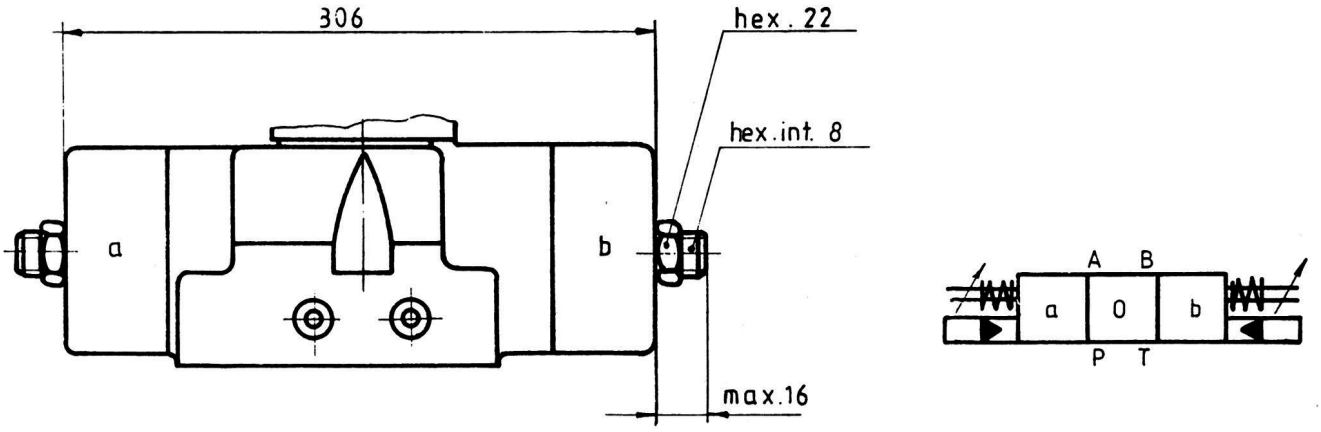


Fig.8

Pressure returned DEH type valves.

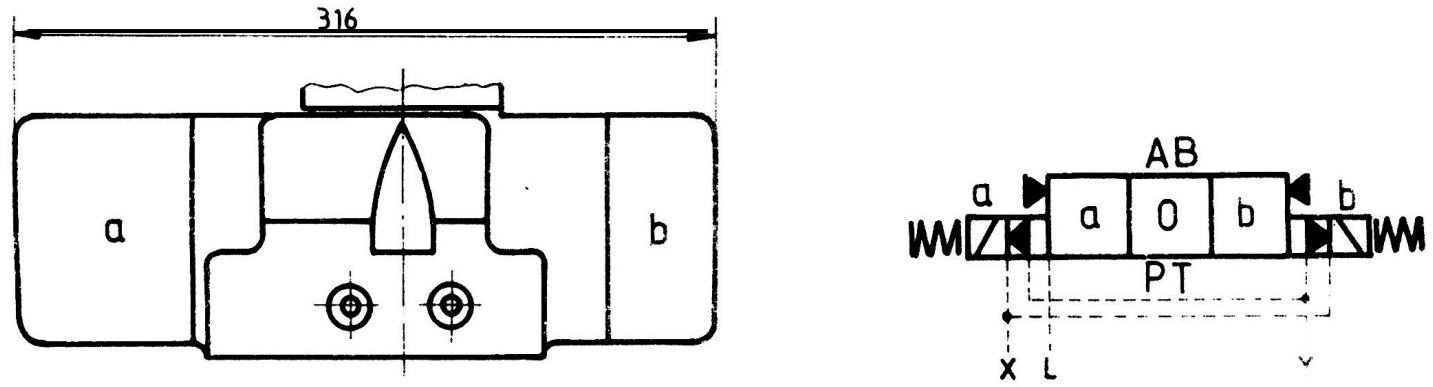


Fig .9

SUBPLATE

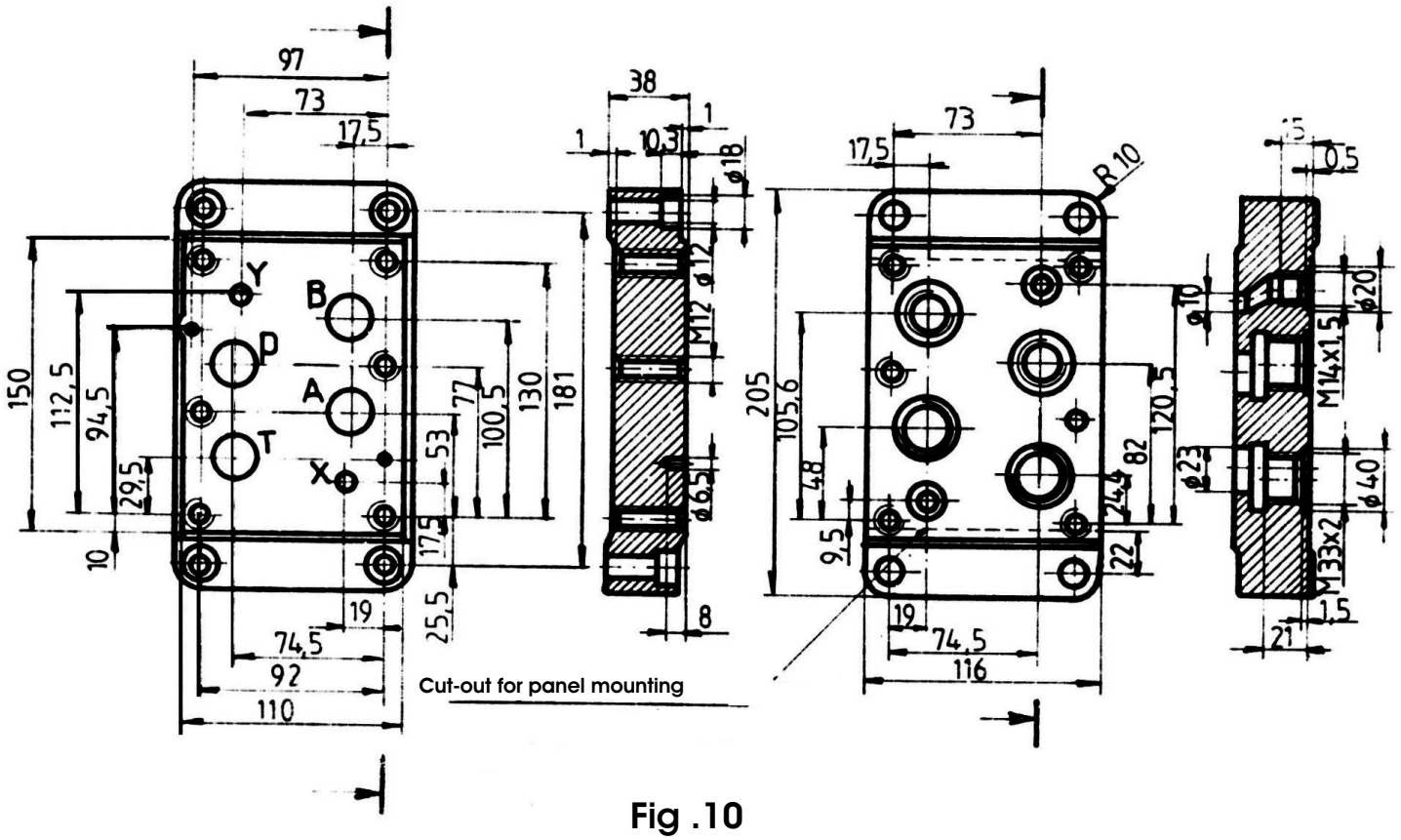


Fig .10

Model code PBD20-1

6 fixing screws M12x55 SR ISO 4762:1993, gr.10.9. Tightening torque $9^{+3.0}$daNm

Screws supplied with valve.

MODEL CODE

123-45678-9-10-11-12-13

1 . D - Directional control valve
2 . Valve actuation
    MN - hand lever operated
    H - direct oil operated
    EH- solenoid operated
    PH - air piloted
3 . 20 - Nominal bore
4. Valve function conforms to tables 3 and 4
5. Shifting time adjusting:
   T - for adjustable variants
   without mark - for not adjustable variants
6. Spool stroke adjustment:
   C - for adjustable variants
   without mark - for not adjustable variants
7. Return to middle position
   H - pressure returned
   without mark - spring returned
8. Pilot flow limiting:
   Z - for limiting variants
   without mark - for no limiting variants.
9, Oil control and drain:
XY- external control, external drain
PT- internal control, internal drain
PY- internal control, external drain
XT- external control, internal drain
10/11- Solenoid voltage
    012/00-12V
    024/00-24V
    096/00-96V
    190/00-190V
    110/50-190V 50Hz
    220/50-220V 50Hz
12.S - Plug-in connector
13 O - Series

Model code forming:
-for DMN type valves: DMN 20-4-13
-for DH type valves: DH 20-4 6-13
-for DEH type valves: DEH 20-4 5 6 7 8-9-10/11-12-13
-for DPH type valves: DPH 20-4 5 6 7 8-9-13