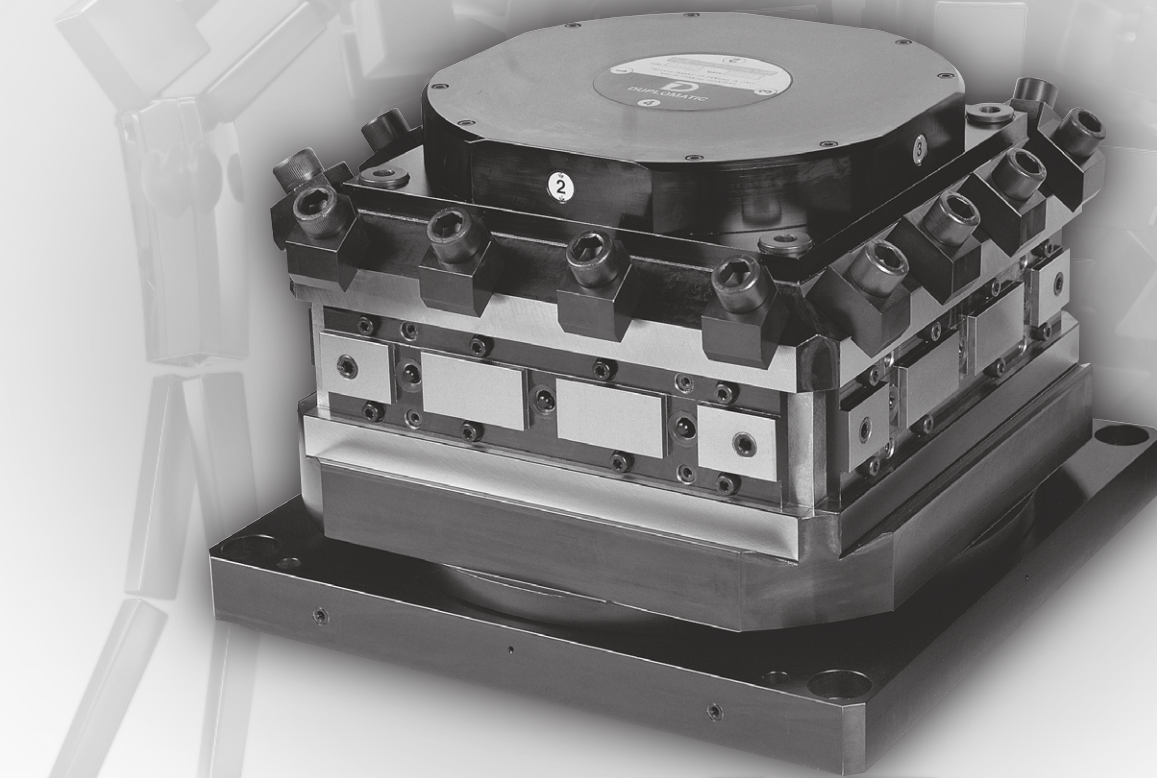




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TRM-S series 20

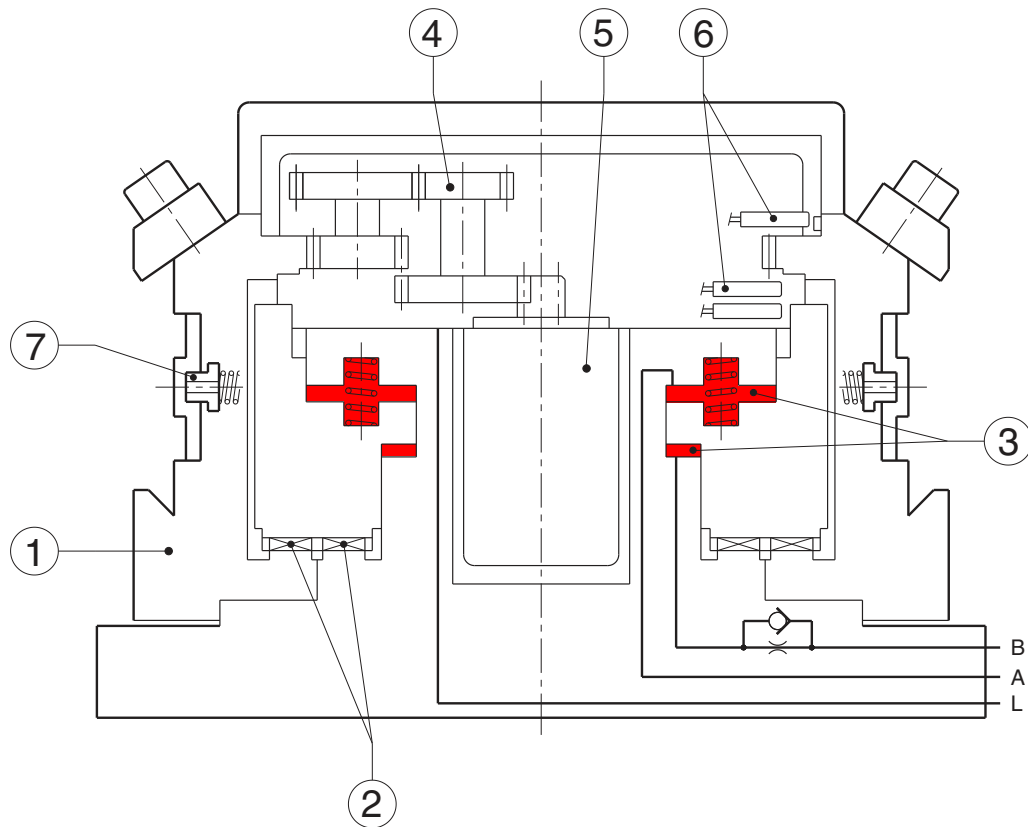
VERTICAL AXIS SERVOMOTOR TURRETS
TOOLHOLDERS CLAMPING DIN 69881-1



TECHNICAL INFORMATION

I.T. 6444

GB ISSUED **02-09**

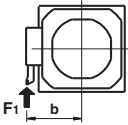
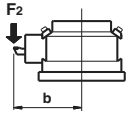
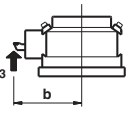
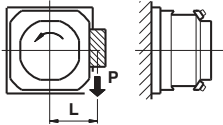


- 1) Tool post
- 2) Front coupling
- 3) Hydraulic clamping / unclamping system
- 4) Gear box
- 5) Servomotor
- 6) Control switches
- 7) Coolant valves

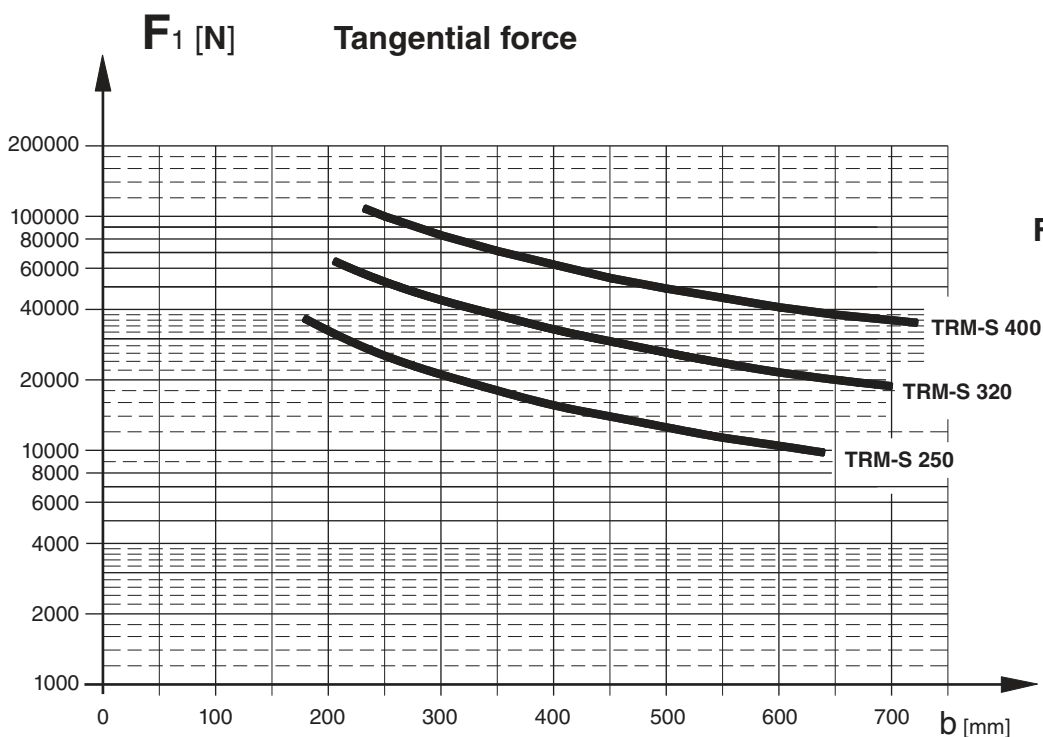
Size		TRM-S 250	TRM-S 320	TRM-S 400	
Tool post size DIN 69881 sheet 1 (ex VDI 3425 sheet 5)	mm	250	320	400	
Tool stations	standard	N°	4	4	4
	optional	N°	6	6	6
Tool section	DIN 69881-115	mm	32 x 32	40 x 40	40 x 40
	DIN 69881-140		40 x 40		
Moment of inertia of transportable mass	Kgm ²	10	25	60	100
Direction of rotation	Bidirectional				
Indexing time for 90° (unclap. - rot. - clamp.) (1)	s	1,8	2,2	2,5	2,9
Rotation time for 90°	s	1,0	1,25	1,6	2,0
Indexing frequency $\alpha = 90^\circ$	cycle/min	8	6	5	4
Indexing accuracy	Deg°	± 4"	± 4"	± 4"	
Precisione di ripetibilità <i>Repeatability accuracy</i>	Deg°	± 1,6"	± 1,6"	± 1,6"	
Control Unit	Electric supply - Inputs / Outputs	See electrical diagram			
Hydraulic clamping / unclamping pressure	bar	50 ±10%	50 ±10%	50 ±10%	
Mass	~ Kg	120	210	400	
Ambient temperature range	°C	5 ÷ 40	5 ÷ 40	5 ÷ 40	
Coolant supply: (Filtering ≤ 150 µm)					
	• Costant flow	bar	7	7	7
• Pressure cut-off during turret rotation	bar	14	14	14	
Protection degree (DIN 40050)		IP65	IP65	IP65	

(1) Hydraulic supply properly sized.

Loading capacity

				TRM-S		
				250	320	400
	Max. tangential torque	F1xb	Nm	6.300	13.000	25.000
	Max. tilting torque (to push)	F2xb	Nm	6.900	19.000	35.000
	Max. tilting torque (to lift)	F3xb	Nm	4.500	10.000	17.000
	Unbalancing torque with horizontal axis	PxL	Nm	130	250	450
Transportable mass with vertical axis and load gravity centre on the rotation axis			Kg	130	230	350

Duty performances (F1)

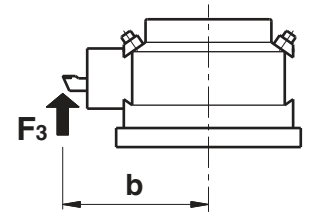
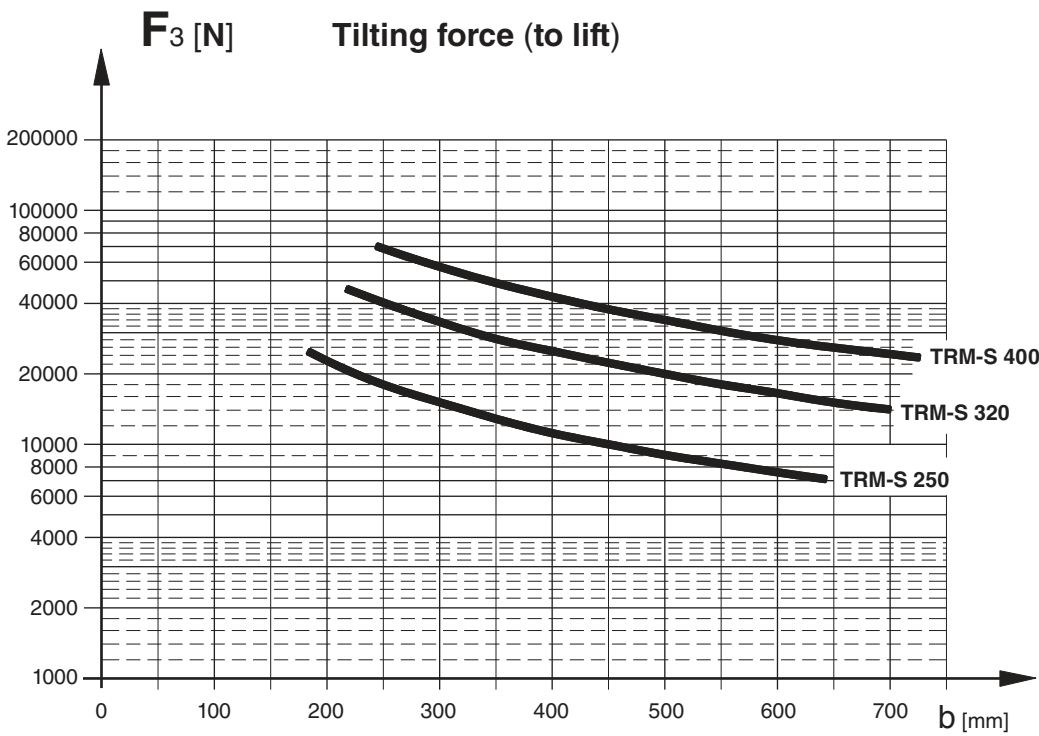
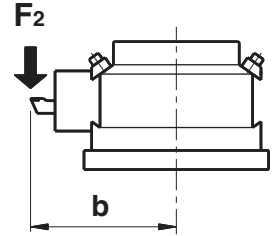
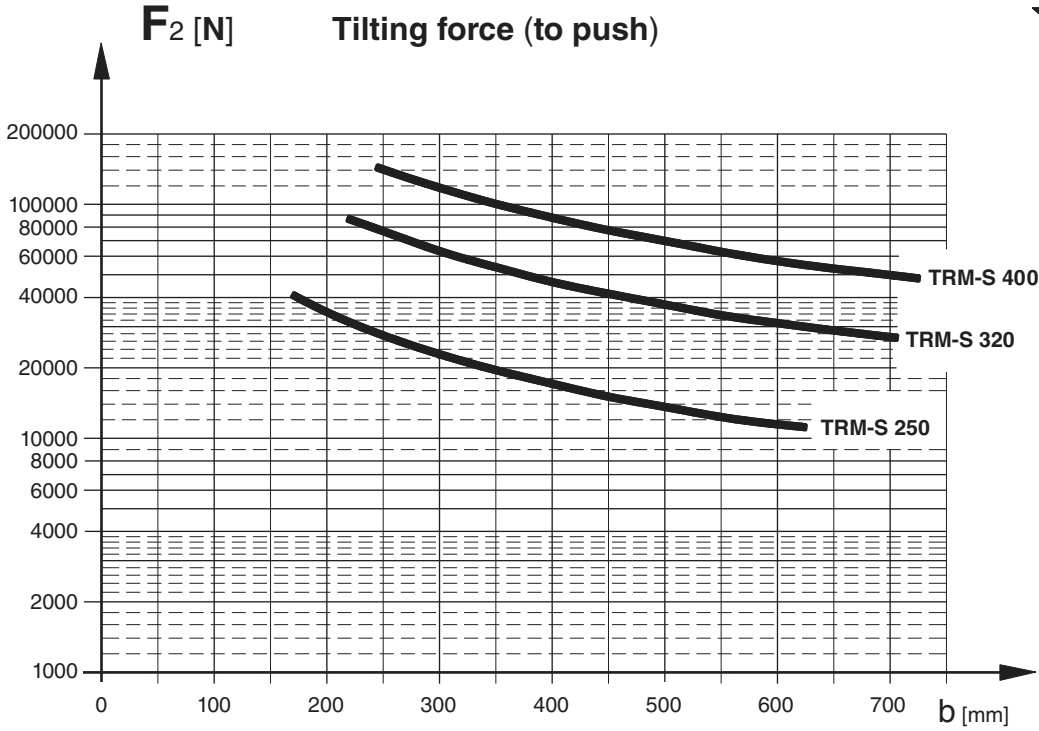




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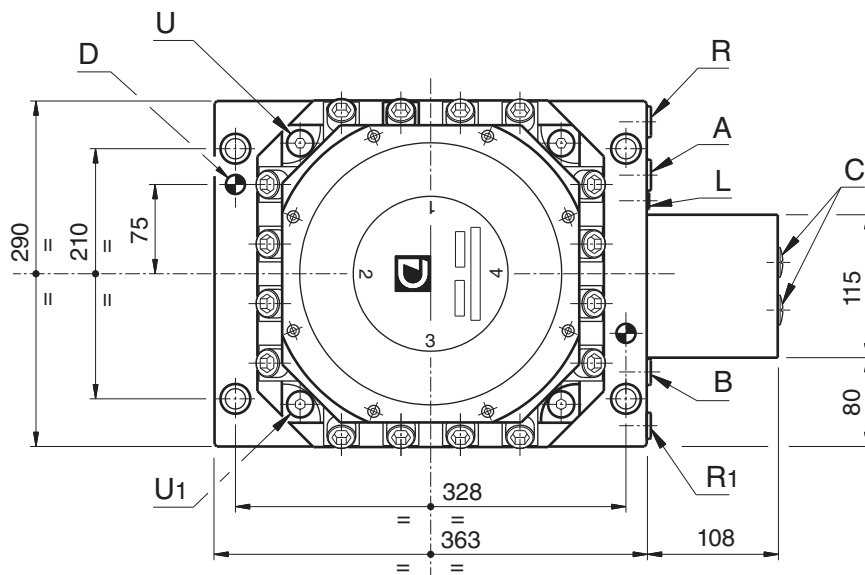
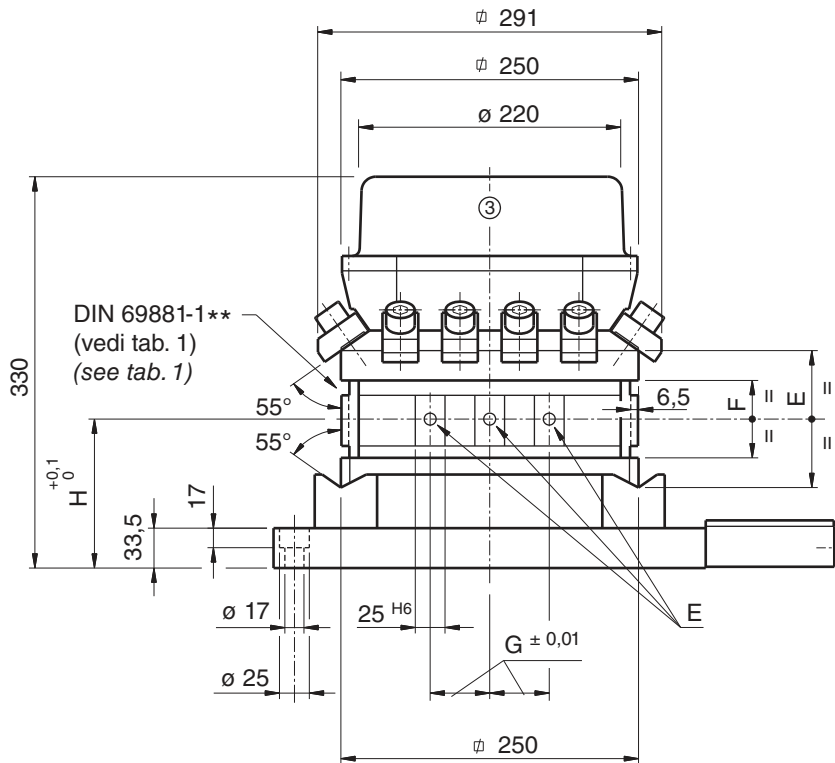
TRM-S / series 20

Duty performances (F2-F3)



TRM-S 250-4 / series 20

OVERALL DIMENSIONS

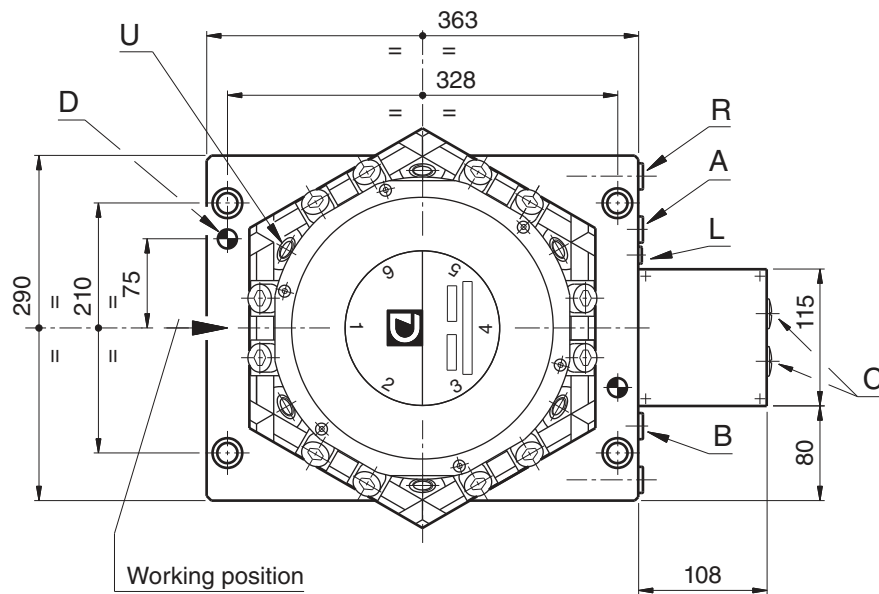
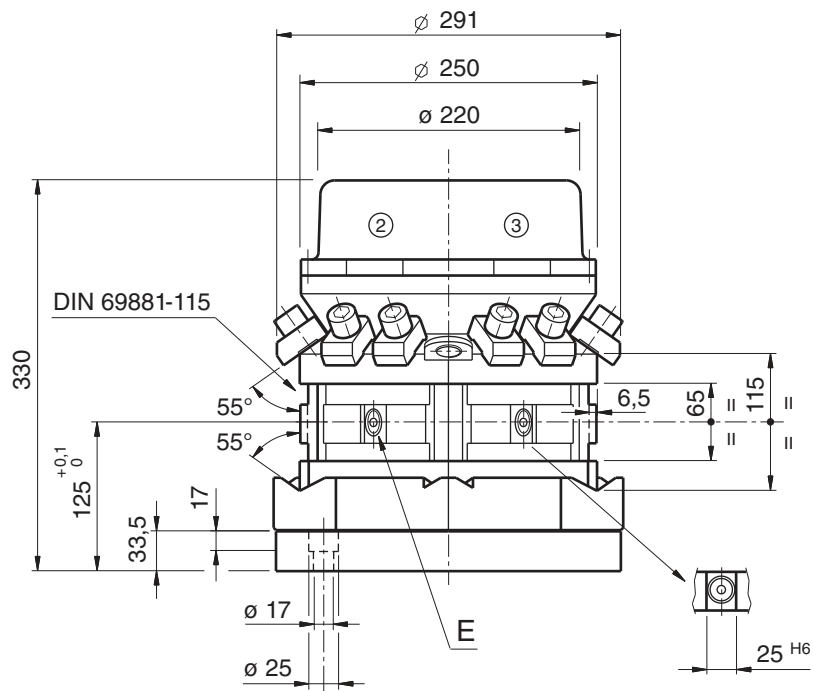


- A-B** — Hydraulic connections 3/8" GAS
- L** — Drain 1/8" GAS
- R** — (or **R1**) coolant inlet 3/8" GAS
- U** — (or **U1**) coolant outlet 3/8" GAS
- E** — Internal coolant outlet
- C** — PG 13,5 for electrical connections
- D** — Holes for pins \varnothing 16

Tab. 1	E	F	G	H
DIN 69881-115	115	65	50	125
DIN 69881-140	140	80	60	130

TRM-S 250-6 / series 20

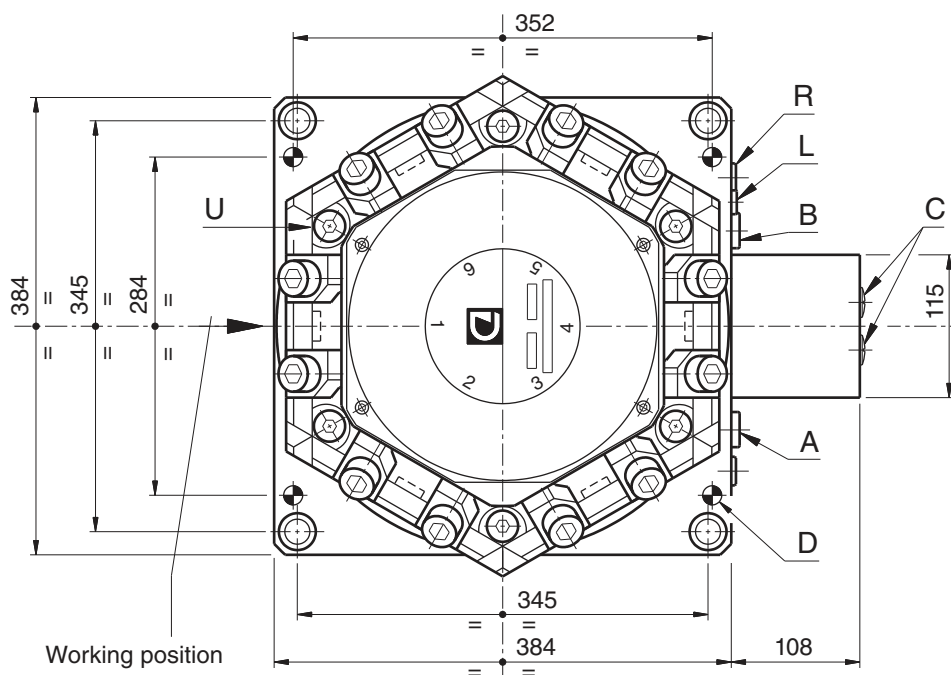
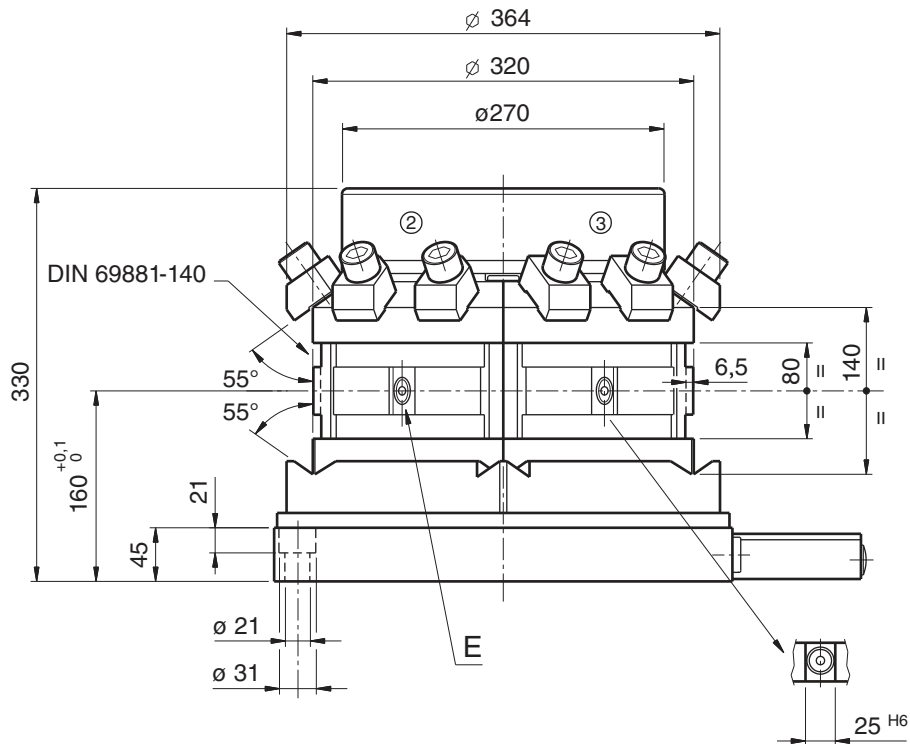
OVERALL DIMENSIONS



- A-B — Hydraulic connections 3/8" GAS
- L — Drain 1/8" GAS
- R — Coolant inlet 3/8" GAS
- U — Coolant outlet 3/8" GAS
- E — Internal coolant outlet
- C — PG 13,5 for electrical connections
- D — Holes for pins $\varnothing 16$

TRM-S 320-6 / series 20

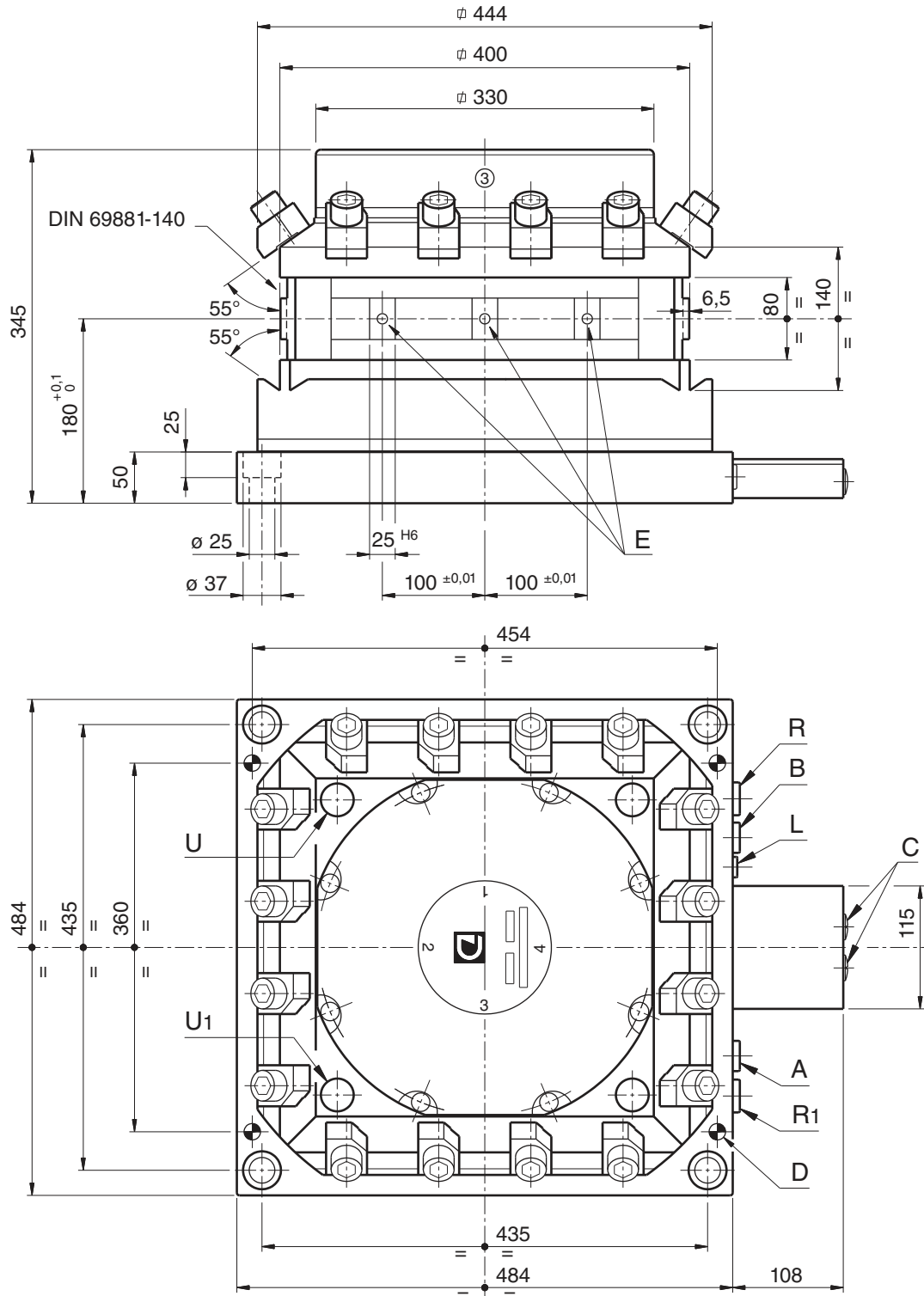
OVERALL DIMENSIONS



- A-B** — Hydraulic connections 1/2" GAS
- L** — Drain 1/4" GAS
- R** — Coolant inlet 3/8" GAS
- U** — Coolant outlet 3/8" GAS
- E** — Internal coolant outlet
- C** — PG 13,5 for electrical connections
- D** — Holes for pins \varnothing 16

TRM-S 400-4 / series 20

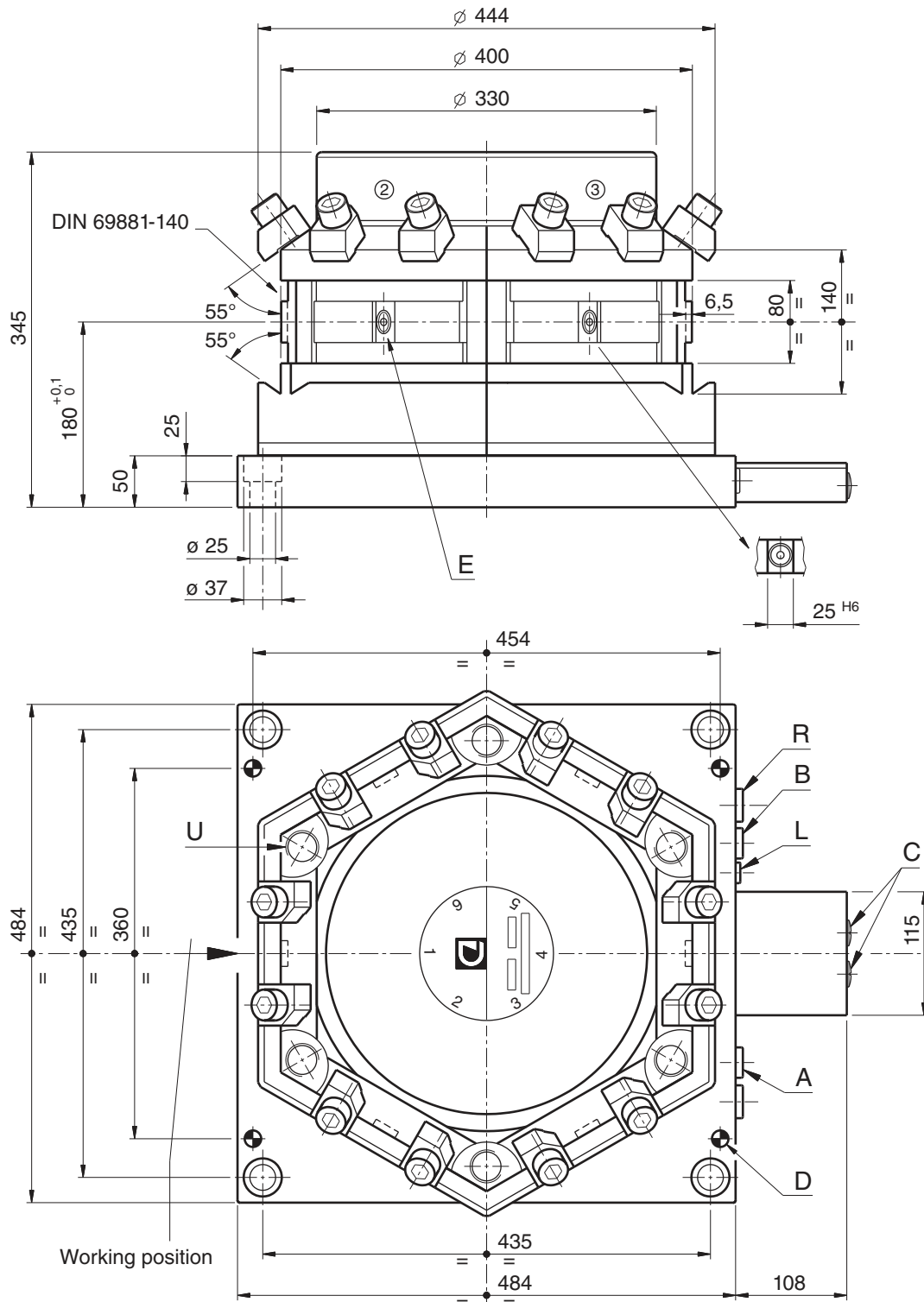
OVERALL DIMENSIONS



- A-B** — Hydraulic connections 1/2" GAS
- L** — Drain 1/4" GAS
- R** — (or **R1**) coolant inlet 3/4" GAS
- U** — (or **U1**) external coolant outlet 3/4" GA
- E** — Internal coolant outlet
- C** — PG 13,5 for electrical connections
- D** — Holes for pins $\varnothing 16$

TRM-S 400-6 / series 20

OVERALL DIMENSIONS

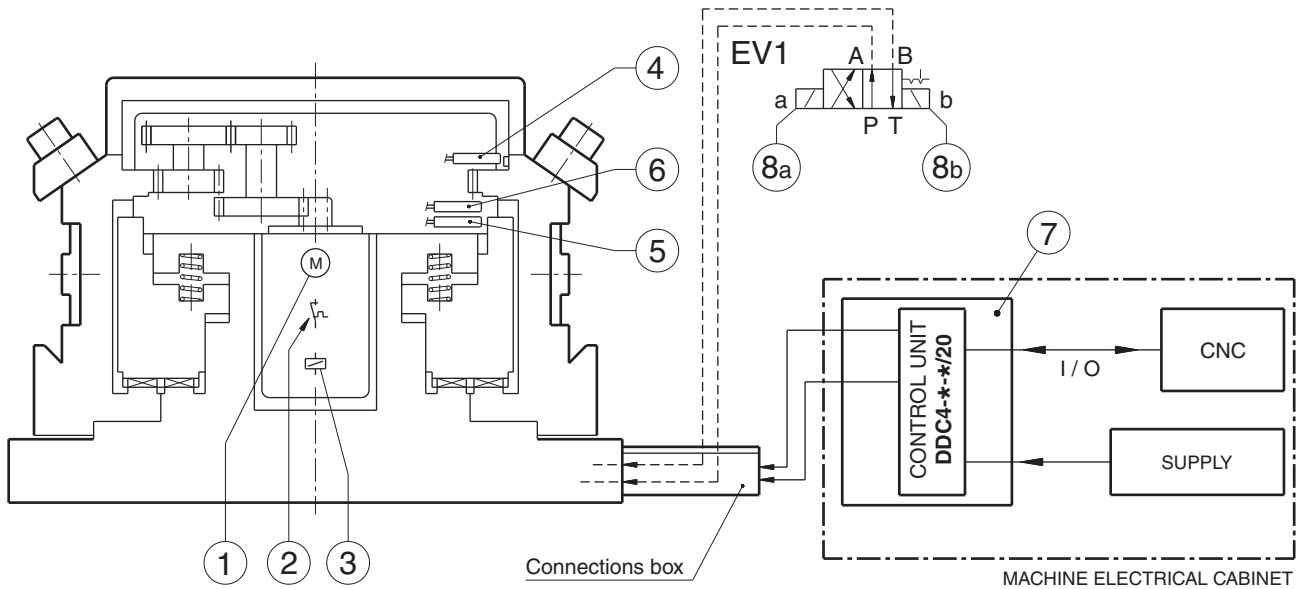


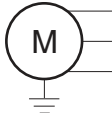

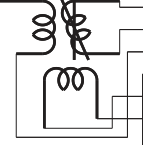






TRM-S / series 20

WIRING DIAGRAM

The **TRM-S*** turrets are supplied with the **DDC* Control Unit** that drives the complete indexing cycle and that must be installed inside the machine electrical cabinet.

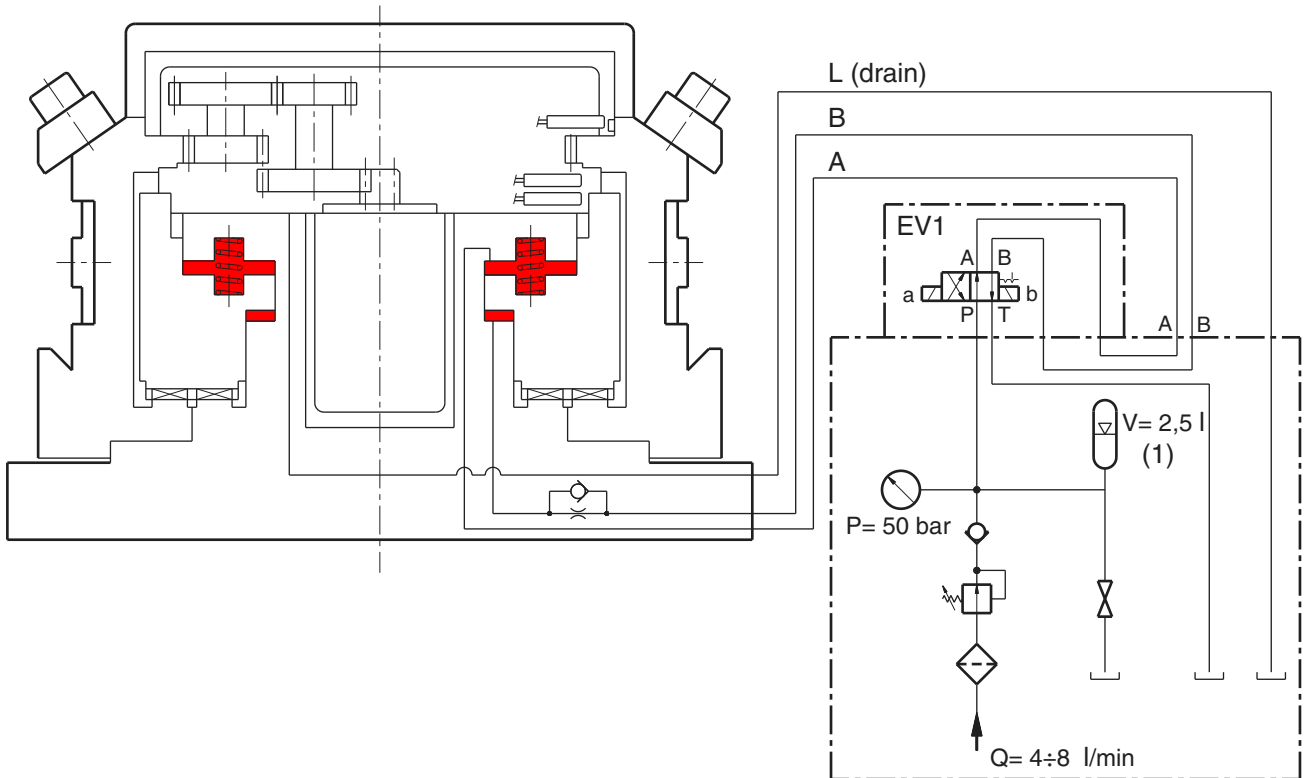
The turret-side electrical connections are carried-out by terminal boards, inside the connections box.



REF.	COMPONENT	CHARACTERISTICS	WIRING NUMBER		SIGNALS
			SIMBOLS	COLOUR	
1	SERVOMOTOR			7 WHITE 8 BLUE 9 RED	W V U
2	THERMAL DETECTOR	100 C 1.5A 250V OUTPUT - NC		10 BLUE 15 BLUE	+ 24 V MOTVL
3	RESOLVER			1 WHITE / RED 2 WHITE / BLACK 3 RED 4 BLACK 5 YELLOW 6 BLUE	RPOW RPOWG RSIN RSING RCOS RCOSG
4	TURRET ZERO POINT SWITCH	24V D.C. ± 10% 200 mA (load) OUTPUT-PNP-NO		10 BROWN 11 BLACK 12 BLUE	+ 24 V ZEROSW 0 V
5	TURRET CLAMPING SWITCH			10 BROWN 13 BLACK 12 BLUE	+ 24 V LOCKSW 0 V
6	TURRET UNCLAMPING SWITCH			10 BROWN 14 BLACK 12 BLUE	+ 24 V UNLCKSW 0 V
7	DDC4-20-230/20- DDC4-10-400/20-*	230 VAC 400 VAC		See Electrical Manual E.M. DDC4-*/*	
8a	TOOL ENGAGED SWITCH	See data sheet of selected valve			+ COMMON
8b	VALVE EV1				+ COMMON
					PE

TRM-S / series 20

HYDRAULIC DIAGRAM



HYDRAULIC POWER PACK (Example)

(1) The accumulator's volume is according to the real pump flow rate.

Supply:

- Working pressure 50 ±10% bar
- Filtered 20 µm
- Oil viscosity 32 ÷ 46 mm²/s
- Recommended oil temperature 35 ÷ 55 °C

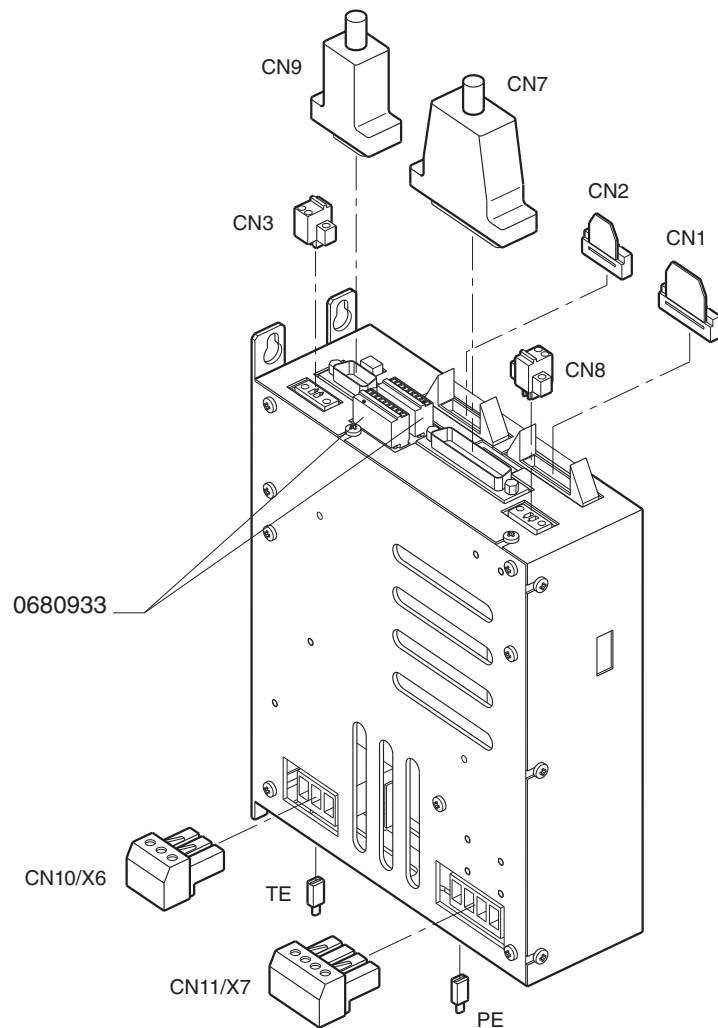
Size	TRM-S	250	320	400
Required oil volume				
Clamping		73	125	187
Unclamping		32	50	109
[cm ³]				
Needed istant flow	[l/min]	15	19	28
	for T _b =0,3s	T _b =0,4s	T _b =0,4s	T _b =0,4s

Functions	EV1	
	sol. a	sol. b
Clamping turret	-	+
Unclamping turret	+	-

Connections on the turret				
A	GAS	3/8"	1/2"	1/2"
B	GAS	3/8"	1/2"	1/2"
L	GAS	1/8"	1/4"	1/4"

DN recommended nominal diameter for hydraulic line				
Lenght	≤ 6 m	10	12	12
	> 6 m	12	15	15

CONNECTIONS



POWER CONNECTORS

		CABLE SIDE	CODE
CN10/X6	AC supply 3 ~	PC4/3-ST-7,62	0680931
CN11/X7	Motor power	Phoenix contact PC4/4-ST-7,62	0680932
TE/PE	Ground connections	Faston 6,3 mm	not supplied

SIGNAL CONNECTORS

		CABLE SIDE	CODE
CN1	Digital OUTPUTS	20 pins/2 Rows IDC-2,54 mm female DIN 41651	not supplied
CN2	Digital INPUTS	16 pins/2 Rows IDC-2,54 mm female DIN 41651	not supplied
CN3	24VDC for I/O section	Phoenix contact FK-MCP 1,5/2-STF-3,5	0680934
CN8	24VDC for driver section	Phoenix contact FK-MCP 1,5/2-STF-3,5	0680934
CN7	Signal to/from turret	SUB-D 25 female DIN 41652	not supplied
CN9	RS232 serial connection	SUB-D 9 female DIN 41652	not supplied

MAIN SPECS

SUPPLY	TRM-S-*
• Power input 3~ (1)	400VAC +15% -10% 18A max
• Auxiliary supply DC	24VDC ±10% 35W
• Frequency range	50/60Hz ±2Hz
SPECS FOR POWER TRANSFORMER:	
• Secondary rate voltage	400 VAC ±10% - 3~
• RATED POWER	1,2 KVA
Max voltage drop at 18A RMS	5%
• Connections DELTA STAR	
• Secondary voltage deviation	±2%

INPUTS	TRM-S-*
• Opto-insulated sink type	
• Voltage range	24 Vd.c. ±10%
• Current	5 mA (24 Vd.c.)
OUTPUTS	
• Transistor MOS N.O. (source)	
• Max voltage	24 Vd.c. ± 10%
• Max. current	2,0 A (Power) 100 mA (Signal)
• Operating temperature (turret)	5 ÷ 40°C
• Humidity	30 ÷ 95%
• Vibration:	
0,5 G RMS (continuosly)	
4 G RMS (for short period)	

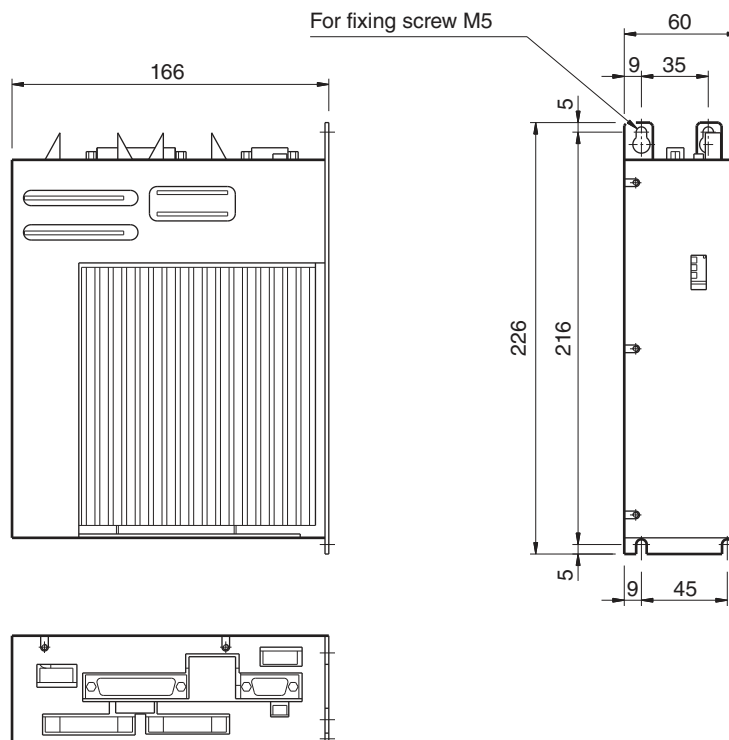
1) Also available in: 230 VAC-3~ , 20A max.

IMPORTANT:

For all details and specs about electrical connections and interfacing to CNC, please refer to relevant Electrical Manual **E.M. DDC4-**-***.

OVERALL DIMENSIONS

For all details and specs about electrical connections and interfacing to CNC, please refer to para 4.6 and relevant Electrical Manual **E.M. DDC4-**-***.



"4" POSITIONS

Each turret has two inlets for the coolant, respectively **R** and **R1**, fitted on the base plate. The coolant passes from the base to the turret housing through the two valves **V** and **V1**. On the tool post the coolant outlets are:

- **External coolant** through the outlet holes on the top of tool post **R → U** ; **R1 → U1**.
- **Internal coolant** directly on the tool holder through the valves **E**.

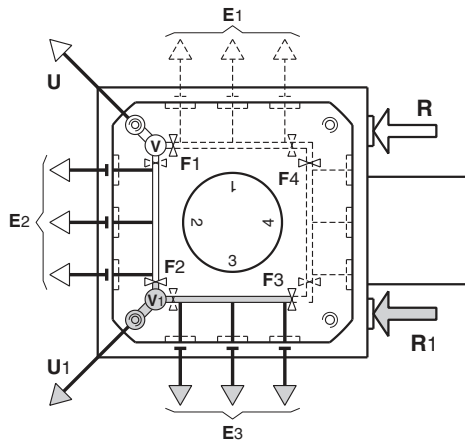


fig. 2

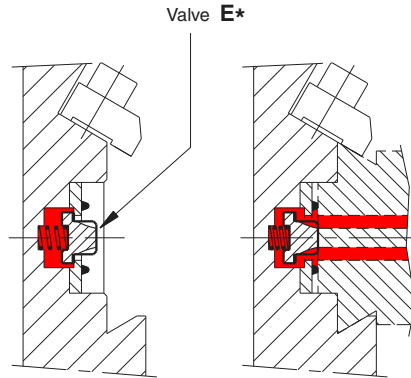


fig. 3

fig. 4

The working of the valve "E" is sketched on the fig. 3 and 4.

Fig. 3 without toolholders (closed valve)

Fig. 4 with toolholders (open valve)

By changing the position of the intercepting valves F1, F2,

F3, F4 is possible to variate the coolant outlet obtaining the follow configurations :

R → E2 R1 → E3 R → E1 R1 → E2

The turrets are normally delivered with all the F* valves fitted inside, that is internal coolant circuit all closed.

"6" POSITIONS

The TRM-S-6 position turrets have one only inlet for the coolant (**R**) fitted on the base plate.

The (**R1**) position is plugged and must not be used.

The coolant pass through the base to the turret housing through the valve **V1**.

On the tool post the coolant outlets are:

- **External coolant** through the outlet holes on the top of tool post **R → U**.
- **Internal coolant** directly on the tool holder through the valve **E**.

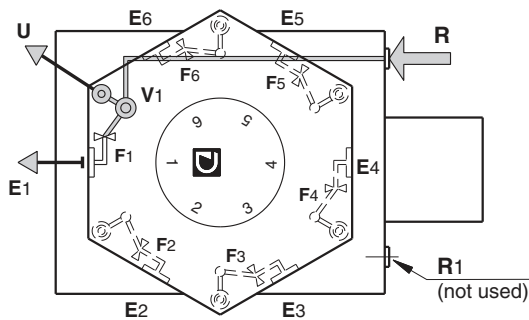


fig. 2

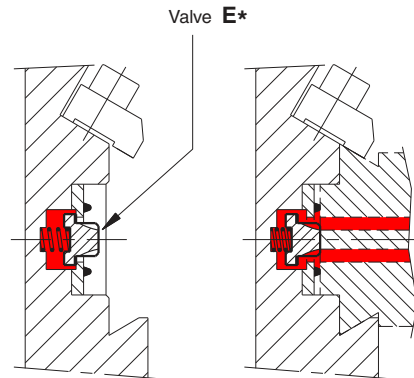


fig. 3

fig. 4

The working of the valve "E" is sketched on the fig. 3 and 4.

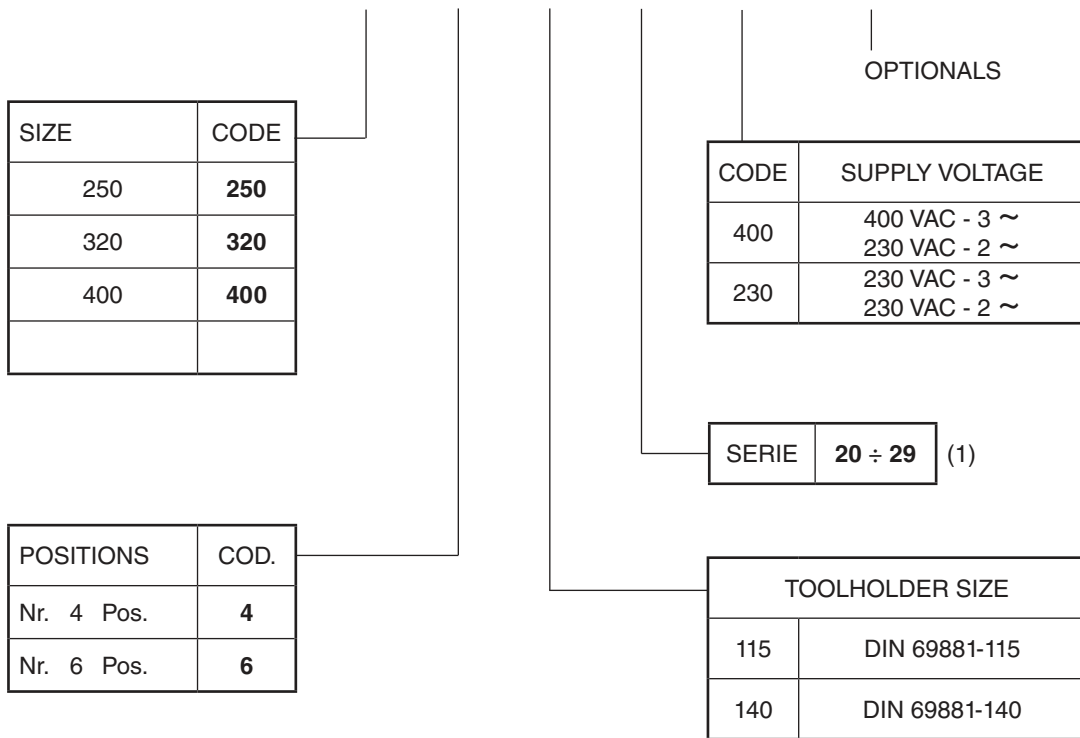
Fig. 3 without toolholders (closed valve)

Fig. 4 with toolholders (open valve)

By opening the valves F*, it's possible to connect the internal coolant circuit.

The supply configuration foresees all 6 F* valves, that is internal coolant circuit all closed.

TRM-S - * - * - * / 1* - * - (*)



(1) From 20 to 29 the performance and the overall dimensions do not change.

DIPLOMATIC AUTOMATION S.r.l.
20025 LEGNANO (MI) - ITALY
P.LE BOZZI, 1
PHONE 0331/472111
FAX 0331/455161



DIPLOMATIC
AUTOMATION

e-mail: info@diplomatic.it

come visit Diplomatic homepage:
www.diplomaticautomation.com