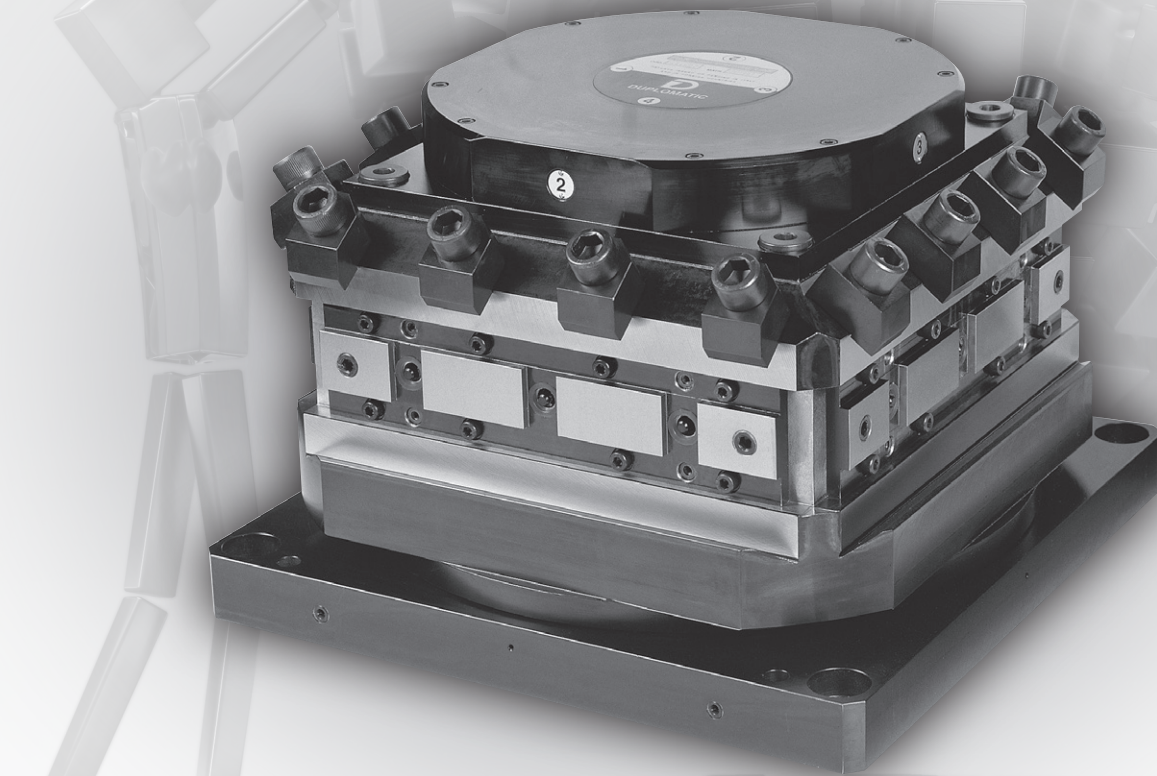




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TRM-S series 20

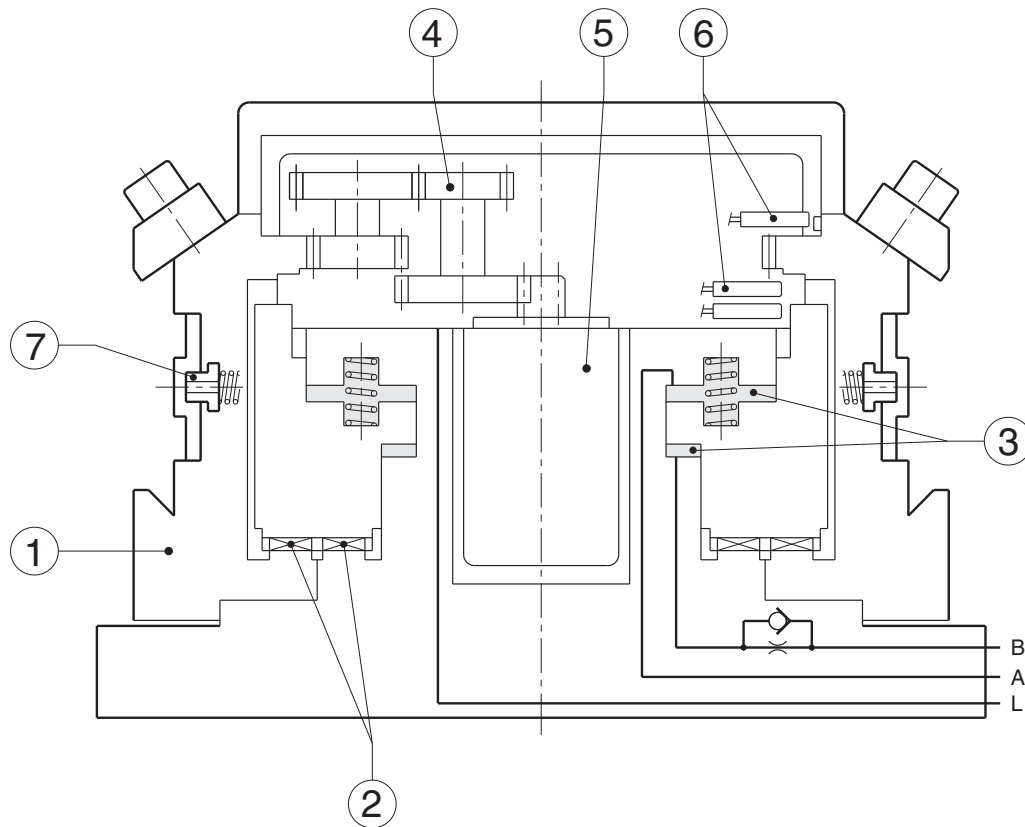
**VERTICAL AXIS SERVOMOTOR TURRETS
TOOLHOLDERS CLAMPING DIN 69881-1**



TECHNICAL INFORMATION

I.T. 6444

GB ISSUED **02-09**

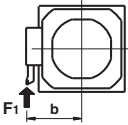
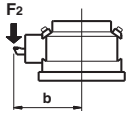
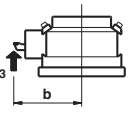
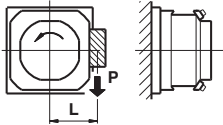


- 1) Tool post
- 2) Front coupling
- 3) Hydraulic clamping / unclamping system
- 4) Gear box
- 5) Servomotor
- 6) Control switches
- 7) Coolant valves

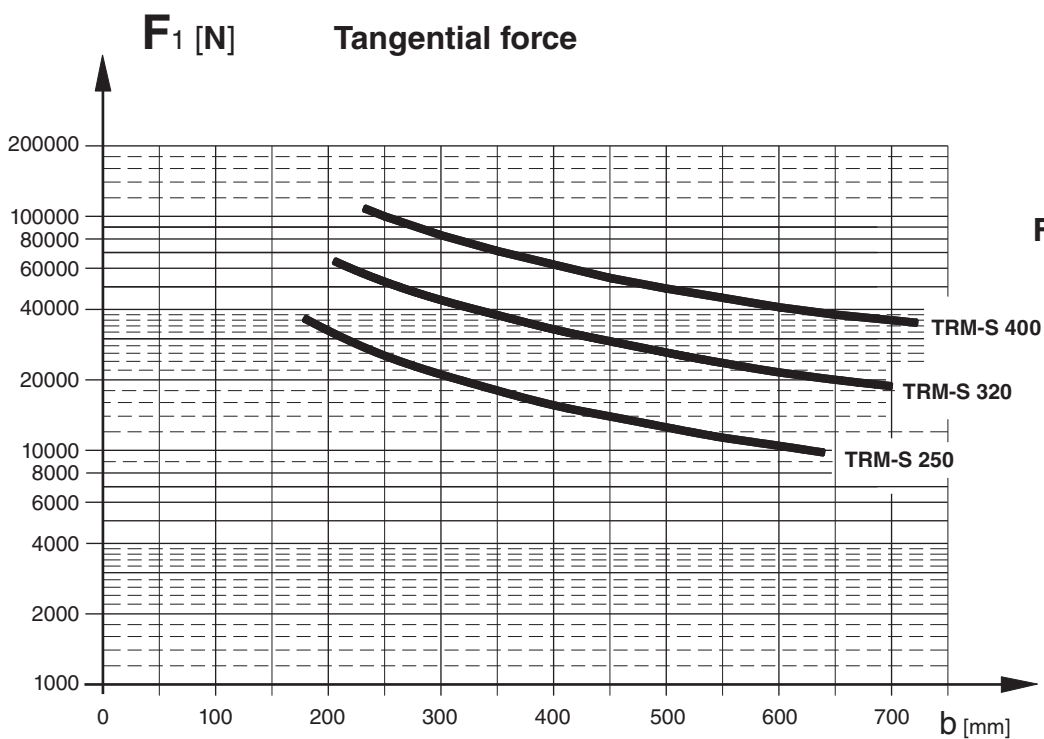
| Size | | TRM-S 250 | TRM-S 320 | TRM-S 400 | |
|---|------------------------------------|------------------------|--------------|--------------|---------|
| Tool post size DIN 69881 sheet 1 (ex VDI 3425 sheet 5) | mm | 250 | 320 | 400 | |
| Tool stations | standard | N° | 4 | 4 | 4 |
| | optional | 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)

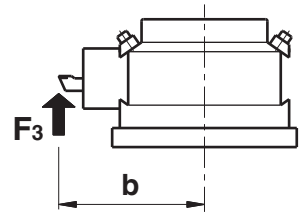
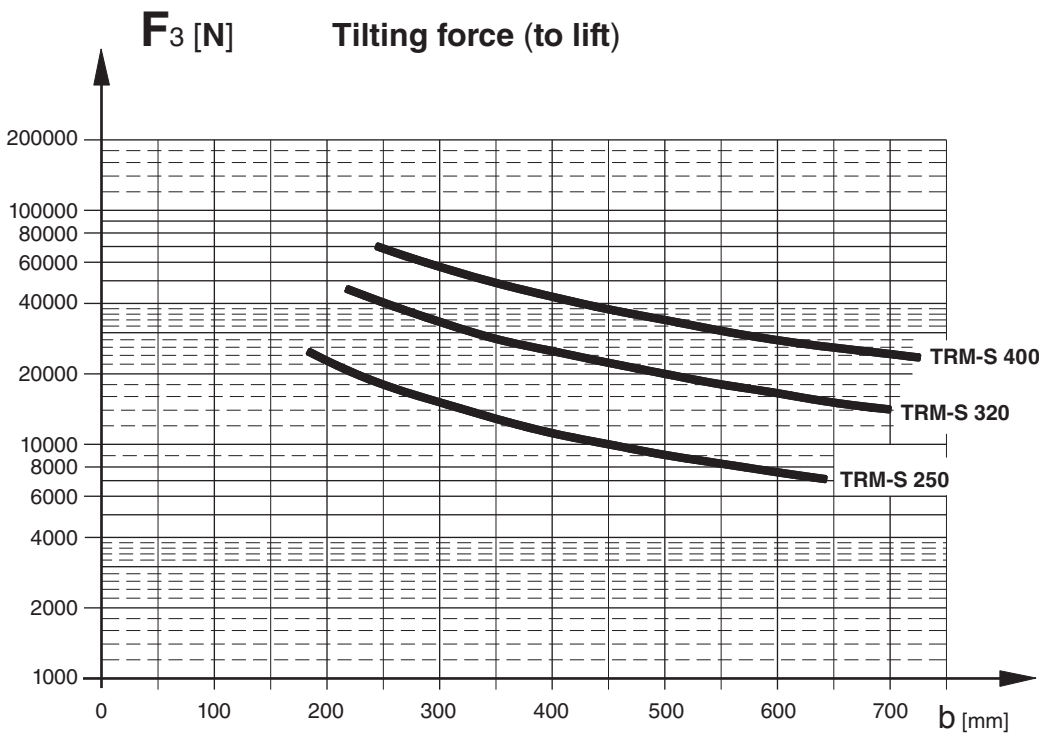
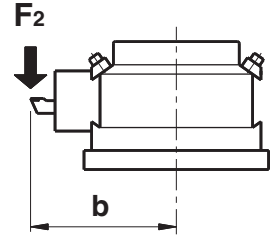
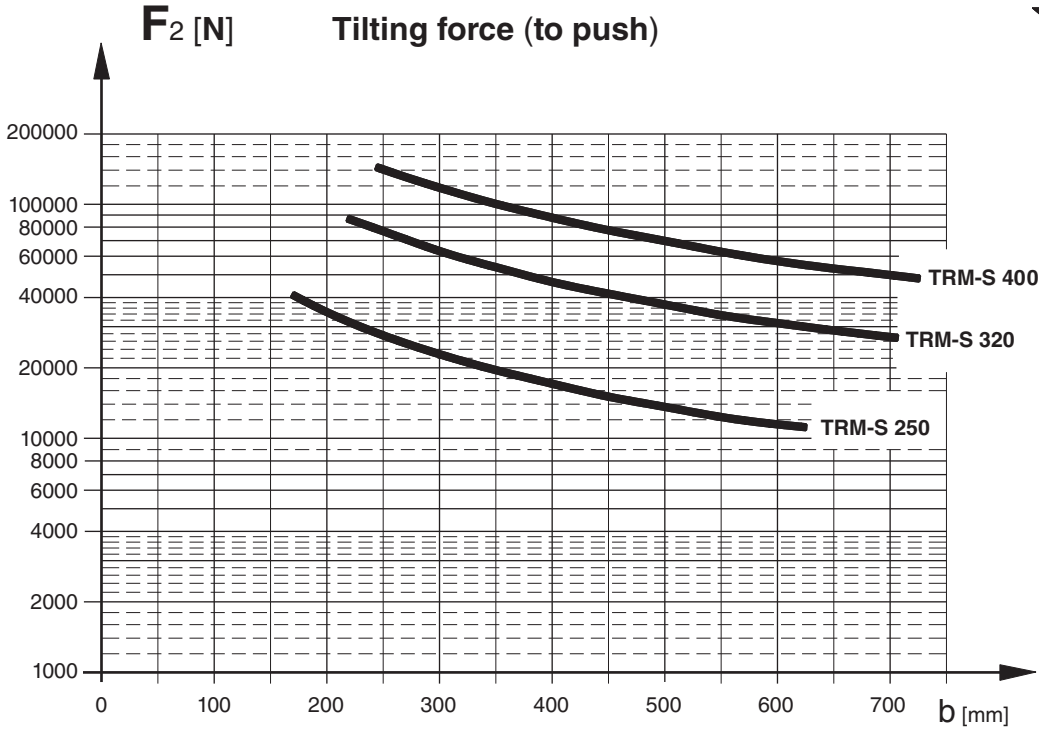




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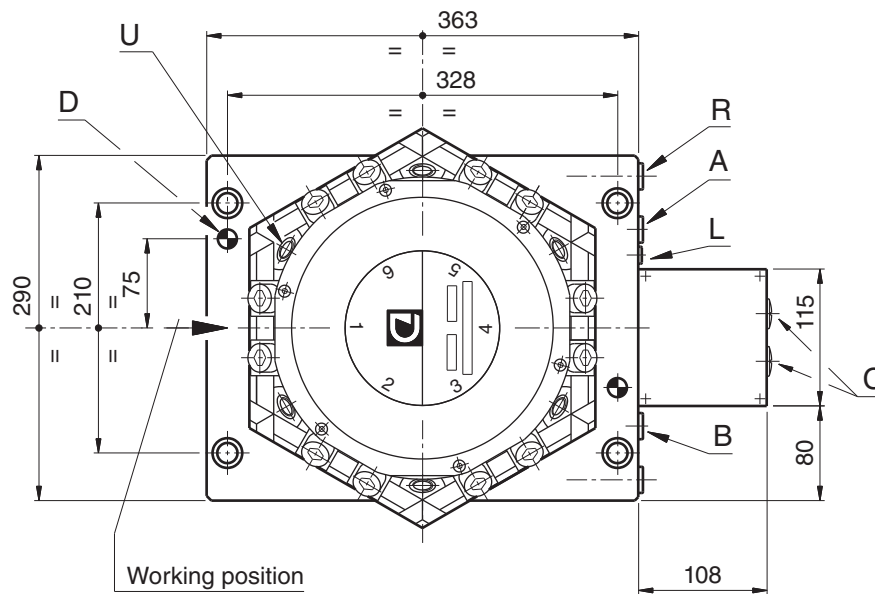
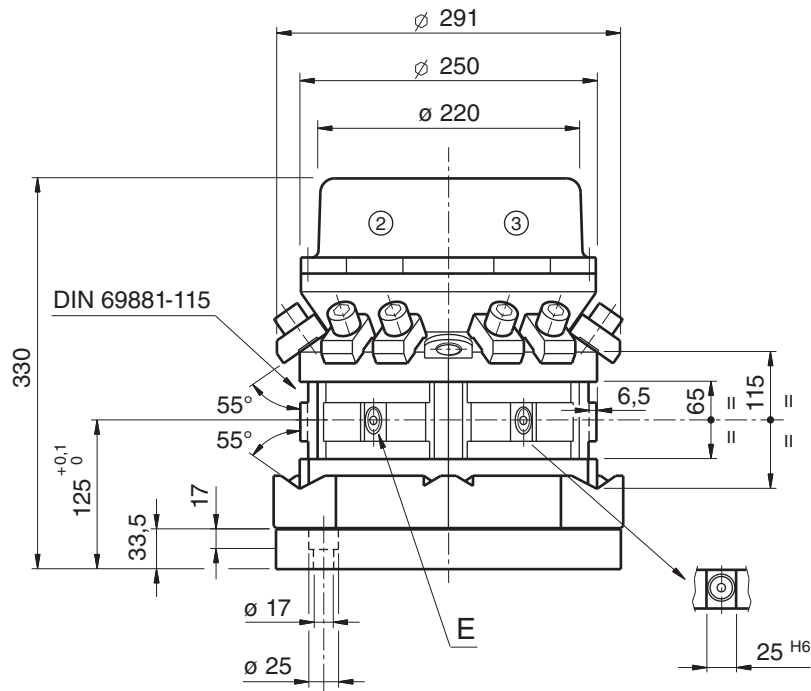
TRM-S / series 20

Duty performances (F2-F3)



TRM-S 250-6 / series 20

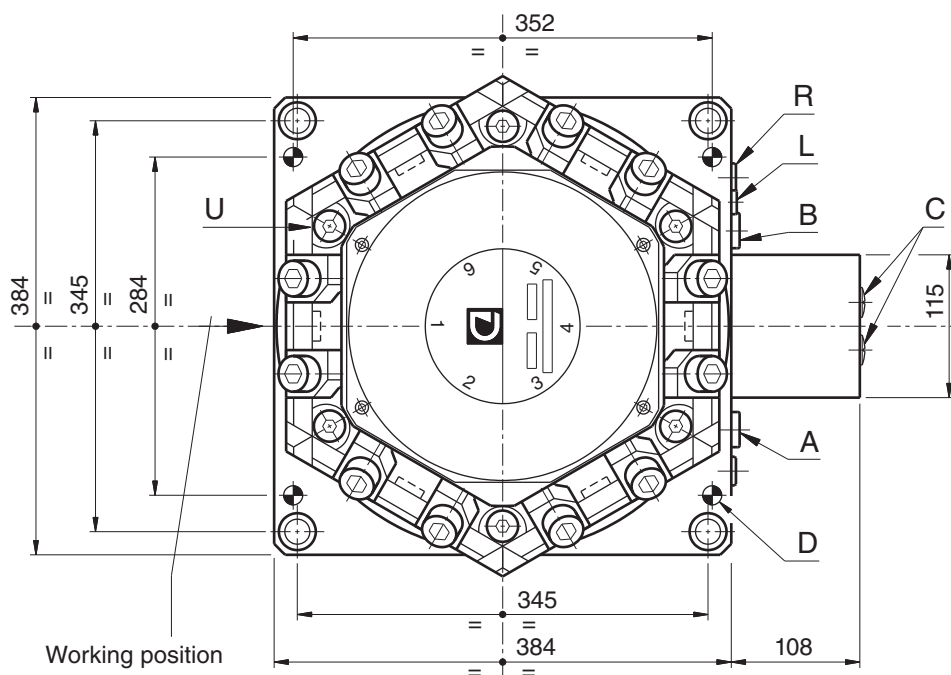
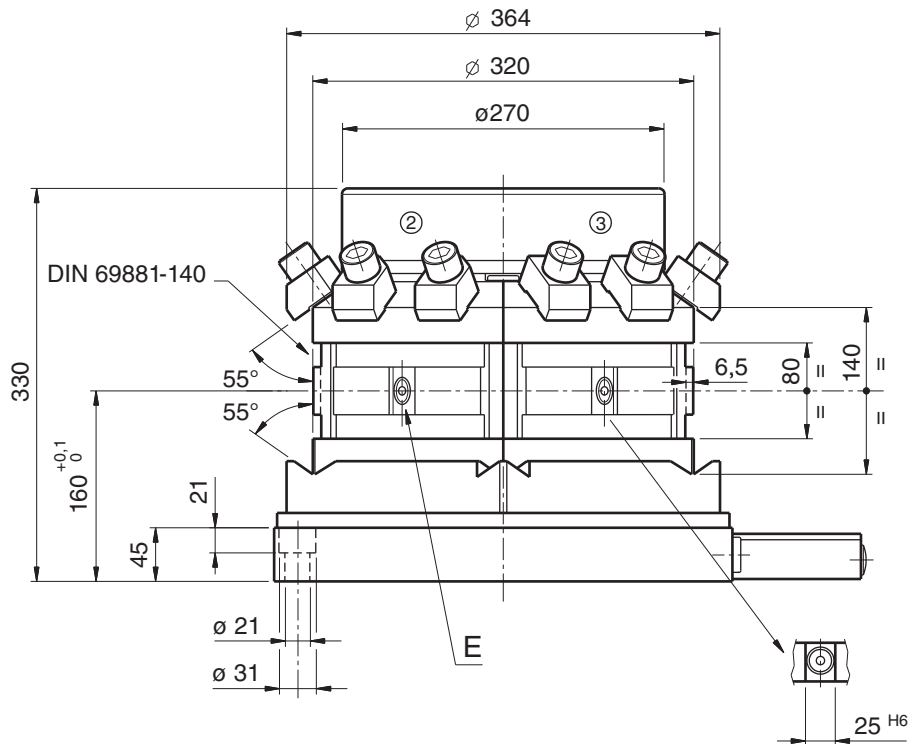
OVERALL DIMENSIONS



- 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

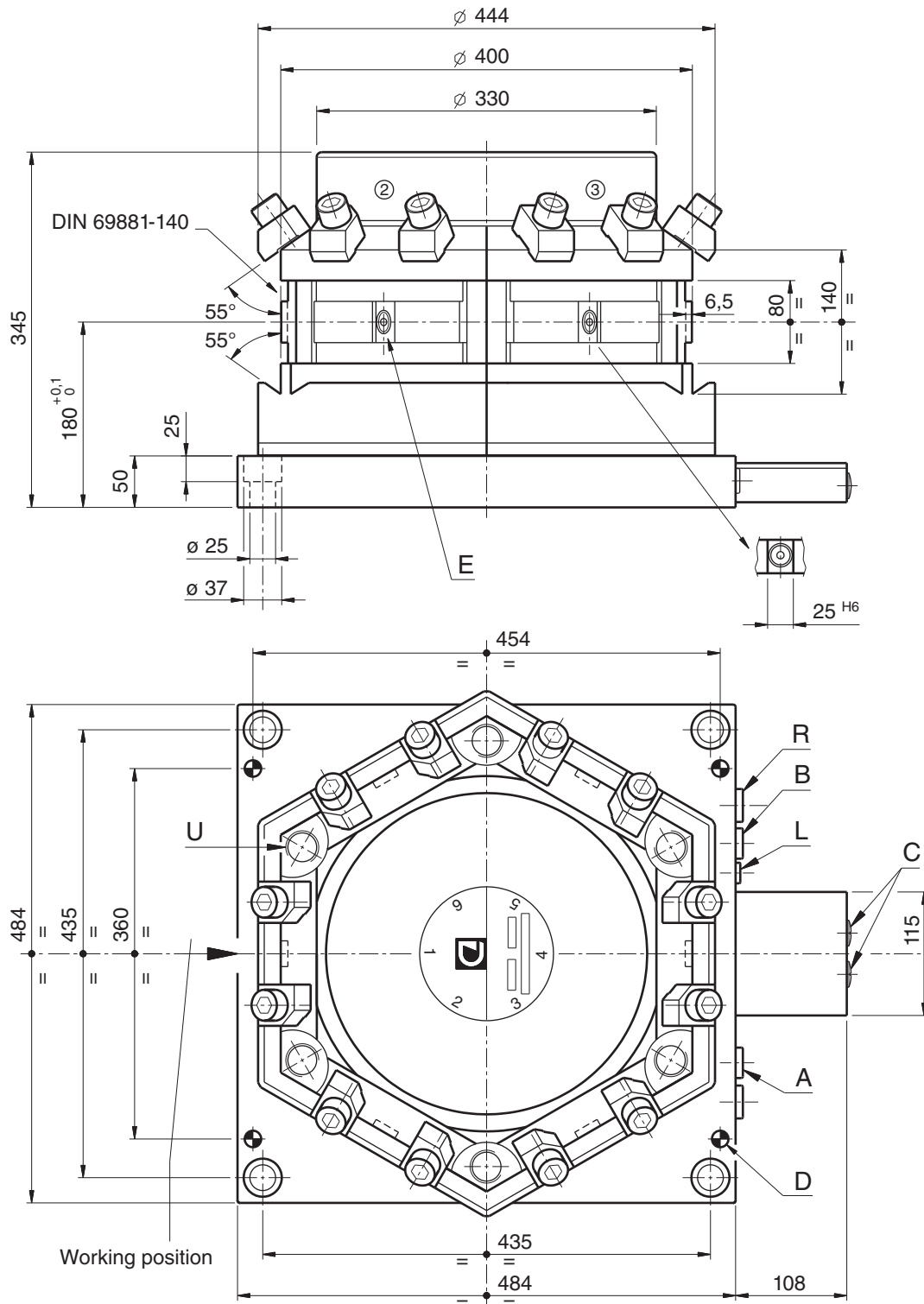
OVERALL DIMENSIONS



- 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 400-6 / series 20

OVERALL DIMENSIONS



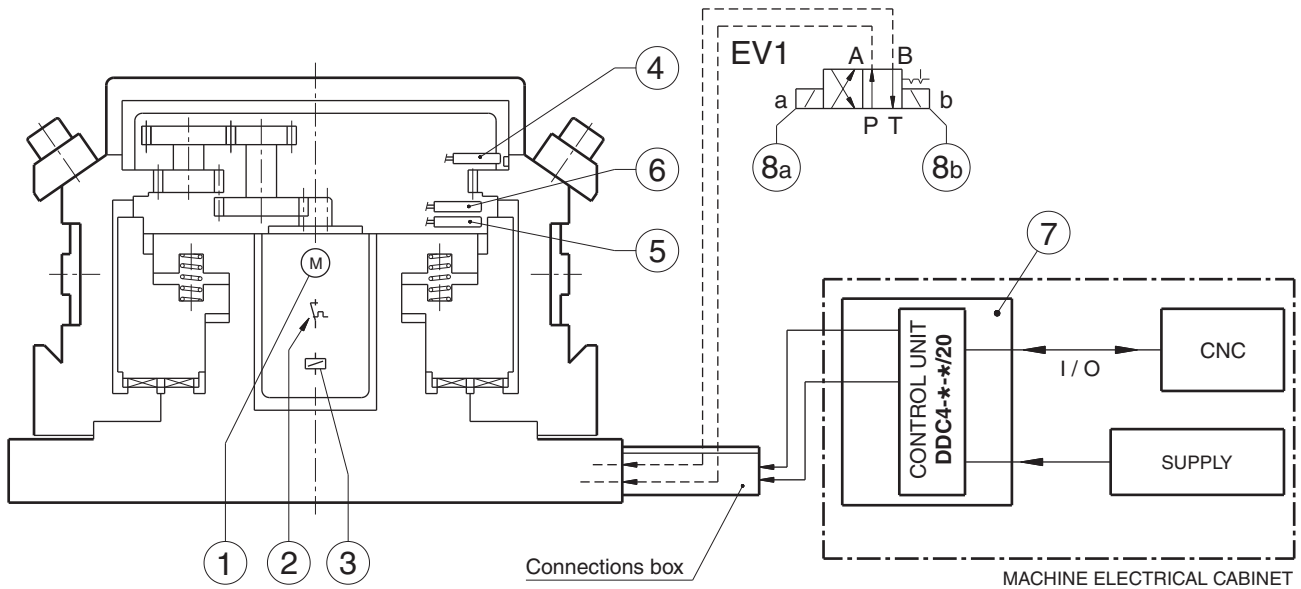
- A-B** — Hydraulic connections 1/2" GAS
- L** — Drain 1/4" GAS
- R** — Coolant inlet 3/4" GAS
- U** — Coolant outlet 3/4" GAS
- E** — Internal coolant outlet
- C** — PG 13,5 for electrical connections
- D** — Holes for pins $\varnothing 16$

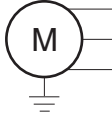

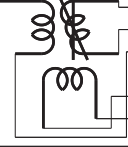






TRM-S / series 20

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.

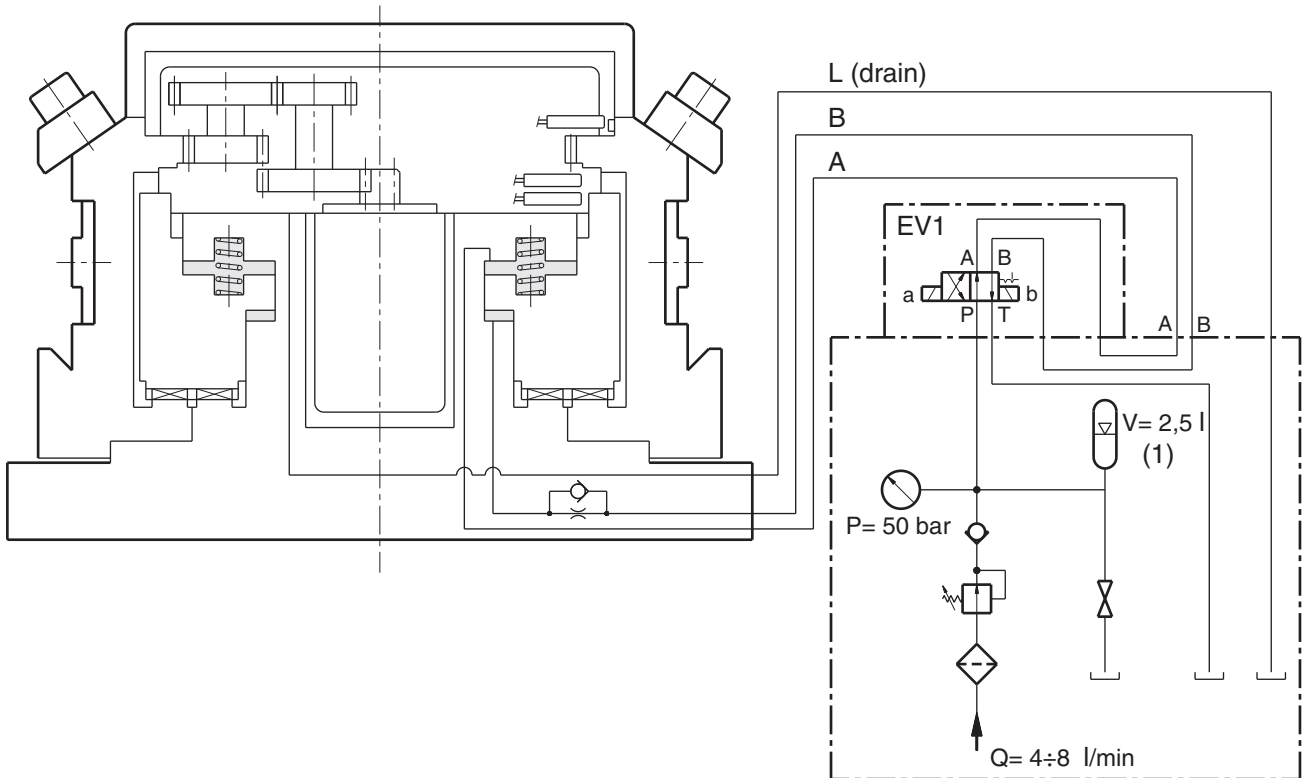
The turret-side electrical connections are carried-out by terminal boards, inside the connections box.



| 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

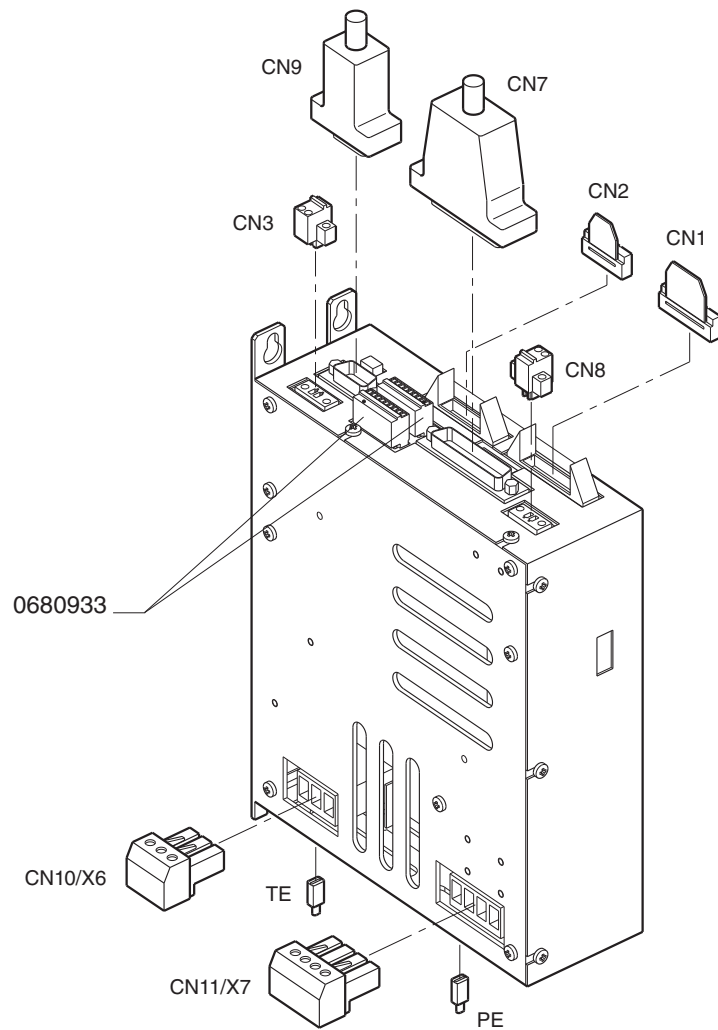
| Size | TRM-S | 250 | 320 | 400 |
|---------------------|---------|----------------------|----------------------|----------------------|
| Required oil volume | | | | |
| Clamping | | 73 | 125 | 187 |
| Unclamping | | 32 | 50 | 109 |
| Needed istant flow | [l/min] | 15 | 19 | 28 |
| | for | T _b =0,3s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

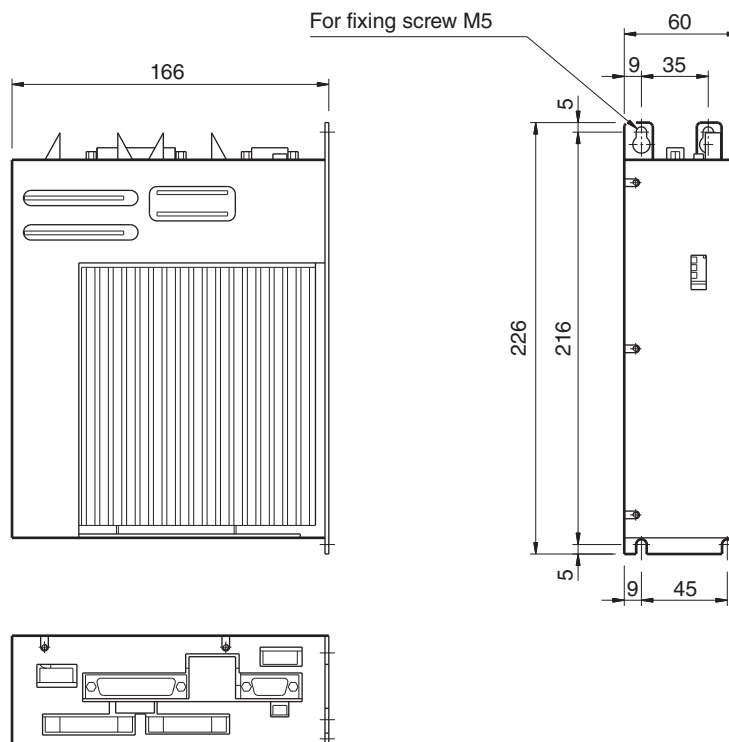
1) Also available in: 230 VAC-3~ , 20A max.

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**.

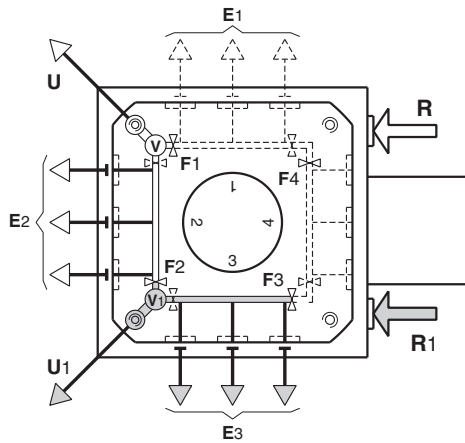


fig. 2

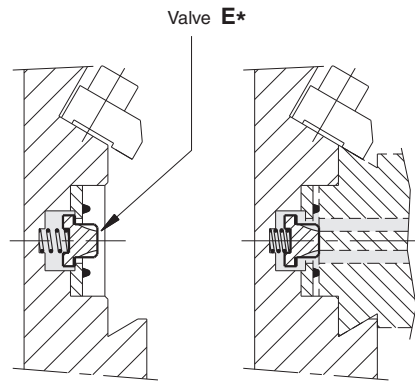


fig. 3

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**.

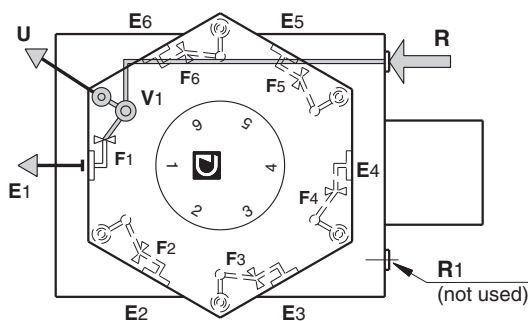


fig. 2

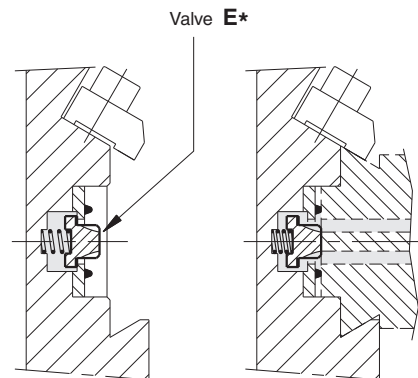


fig. 3

fig. 4

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

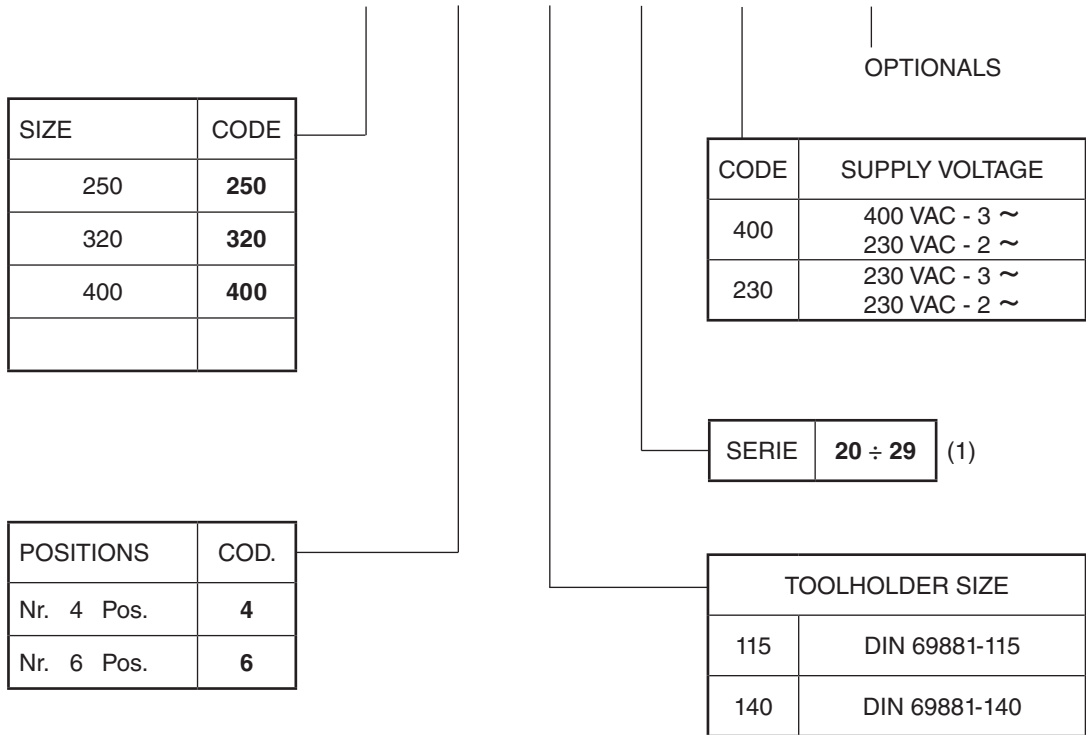
Fig. 3 without toolholders (closed valve)

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