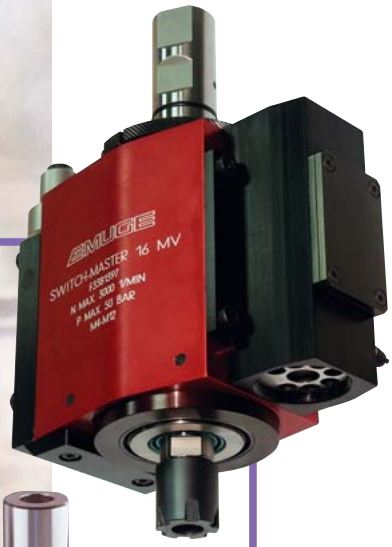
GRN-NC SWITCH-MASTER®



Application range

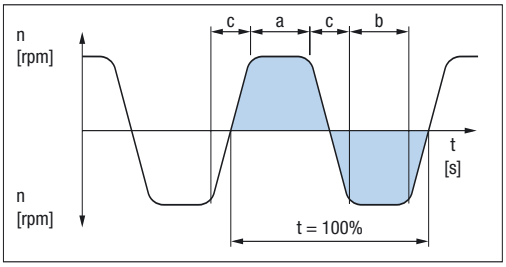
The tapping attachments of our GRN-NC and SWITCH-MASTER® series are designed for use on CNC-controlled machine tools.

General specifications

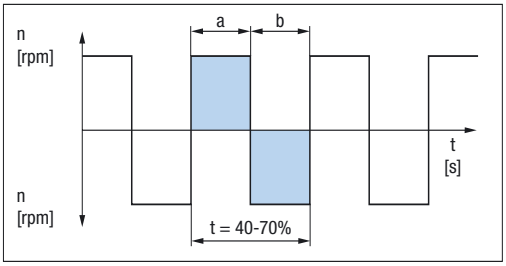
- the integrated reverse gear makes a change of the direction of rotation of the machine spindle for reversal superfluous. The absorption elements integrated in the reverse gear compensate the acceleration forces caused by the change of the direction of rotation of the clamping head.
  The resulting advantages are as follows:
  - time savings due to reduced cycle times
  - reduced stress on the machine spindle due to constant right-hand rotation
  - maximum tool life of the threading tools
  - energy savings due to almost constant power consumption
- design for coolant-lubricant pressure up to 700 psi (50 bar)
- safe and high-concentricity clamping of the tap or roll form tap by means of collets (for improved torque transfer we recommend using collets type ER-GB with integrated square)
- the connection to the machine spindle is a straight shank dia. 25 mm according to DIN 1835 B+E; the use of adapter shanks is a fast and economically efficient way of guaranteeing the compatibility with all the usual spindle adaptations
- the tapping attachments of our GRN-NC and SWITCH-MASTER® series are designed for the production of right-hand threads only; for the SWITCH-MASTER® series, however, there is a possibility of designing the attachment for left-hand threads – the direction of rotation of the machine spindle will always remain right-hand.

Time spent on thread production with different tool holders:

conventional tool holder



tapping attachment GRN-NC or SWITCH-MASTER®



a = time for thread production

b = time for reversal of the threading tool

c = time for switching from right-hand to left-hand rotation of the threading tool

Additional specifications type GRN-NC

- tapping attachments of our GRN-NC series are available in different sizes
- suitable for speeds up to max. 6000 rpm
- transmission ratio advance/reversal 1:0.946

Additional specifications type SWITCH-MASTER®

- tapping attachments of our SWITCH-MASTER® series are available in two designs (90°, 180°)
- suitable for speeds up to max. 3000 rpm
- smooth, low-wear operation thanks to oil-bath lubrication
- safe sealing against the penetration of coolant-lubricant into the housing, by separating the axial and rotational movement of the clamping head
- minimized wear on the gear elements due to extremely fast changes of the direction of rotation (35 ms)
- constant thread depths thanks to an exactly defined switching point
- reduced safety distance of 0.1969 (5 mm) between workpiece and tool thanks to short gear change paths; this yields an additional reduction of cycle times
- almost constant cutting speed, resulting in an increase of tool life
- on the machine side, pressurized air 85^{+14}_{-7} psi ($6^{+1}_{-0.5}$ bar) is needed as auxiliary energy for the change of the direction of rotation

Service

In case spare parts need to be exchanged, EMUGE offers you a repair service that includes e.g. competent repair and maintenance, a professional pressure check and function control with full guarantee.

For the use of our tapping attachments, a stop fixture is needed for the following functions:

- supporting the torque caused by the operation of the attachment
- correct definition of the position between machine spindle and stop fixture whenever automatic tool exchange devices are used
- supply of the auxiliary energy necessary for the change of the direction of rotation on the SWITCH-MASTER® = pressurized air 85^{+14}_{-7} psi ($6^{+1}_{-0.5}$ bar)

The stop fixture is normally fitted individually to the customer's machine before shipping of the attachment.

Specifications for the stop fixture

Address

.....

.....

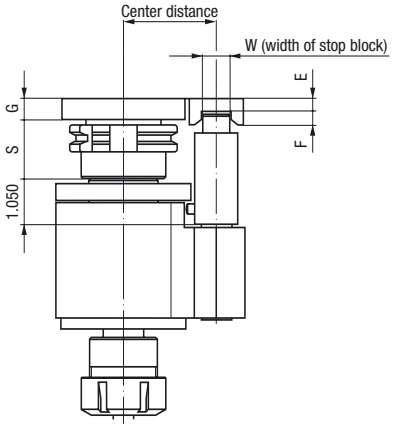
.....

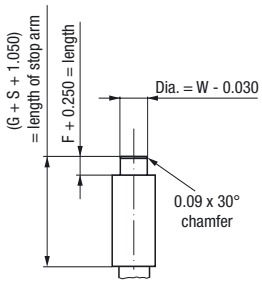
Machine type / description

.....

Machine No.

.....

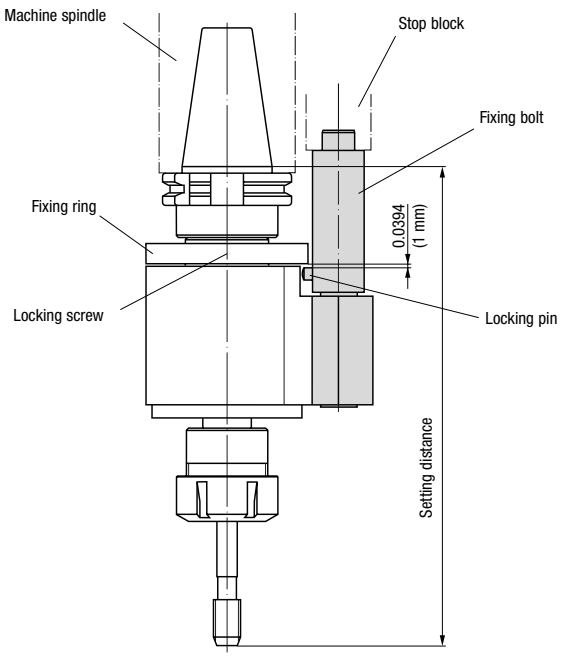




Note: The 1.050 dimension has the necessary clearance of the 0.0394 (1 mm) figured into this dimension that will prevent stop arm from bottoming out Housing.

Thread production cycle (example)

The tapping attachment is changed into the machine by means of the tool exchanging device, the stop fixture bolt engages in the stop block, the locking device is released and the attachment is ready for operation.

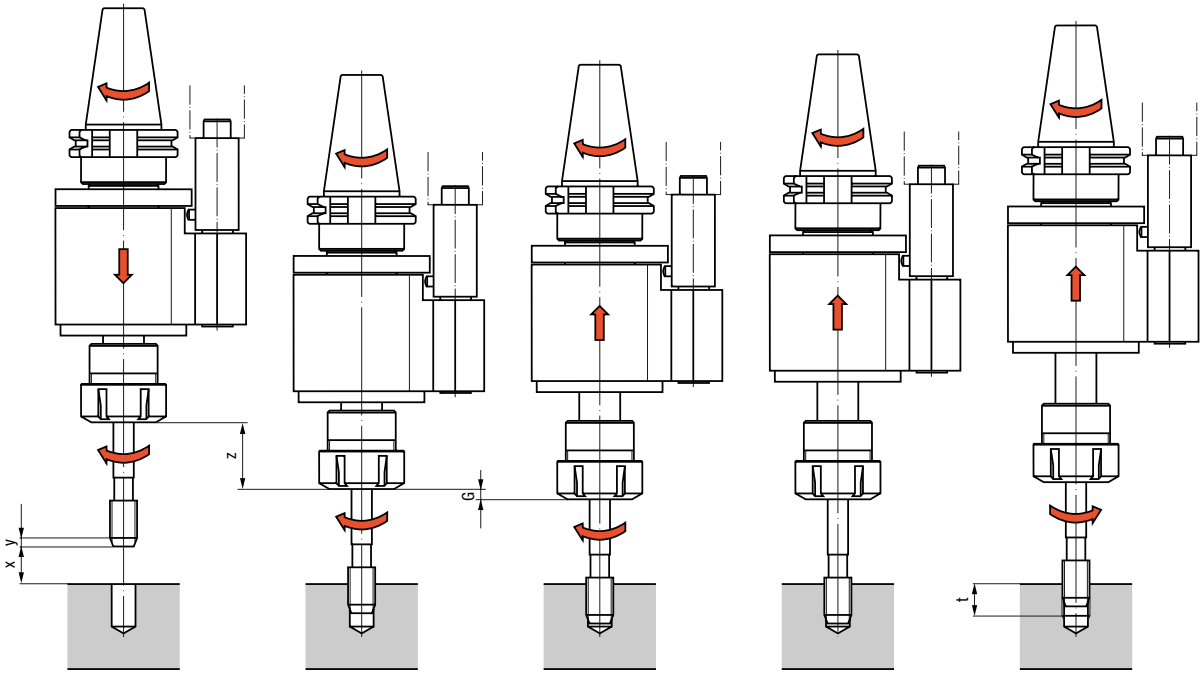


The attachment is moved to start position in the fast-feed mode. The safety distance x must be observed.

The work cycle is performed. During the whole cycle, the machine spindle rotates in a right-hand direction. After reaching the programmed feed depth, the Z-axis switches to reverse without any delay. In the interaction between feed reversal of the Z-axis and the positive feed caused by the pitch of the rotating tool the clamping head of the tool holder is pulled axially from the tapping attachment. This movement operates the change of the direction of rotation (reversal). When the tool has come entirely free from the workpiece the spring-loaded clamping head retracts to its original position, and the direction of rotation of the tool is changed again.

The machine spindle is again in start position.

GRN-NC Thread production cycle



= Spindle movement in axial direction

= Rotation of the tool

Example for the travel z to be programmed:

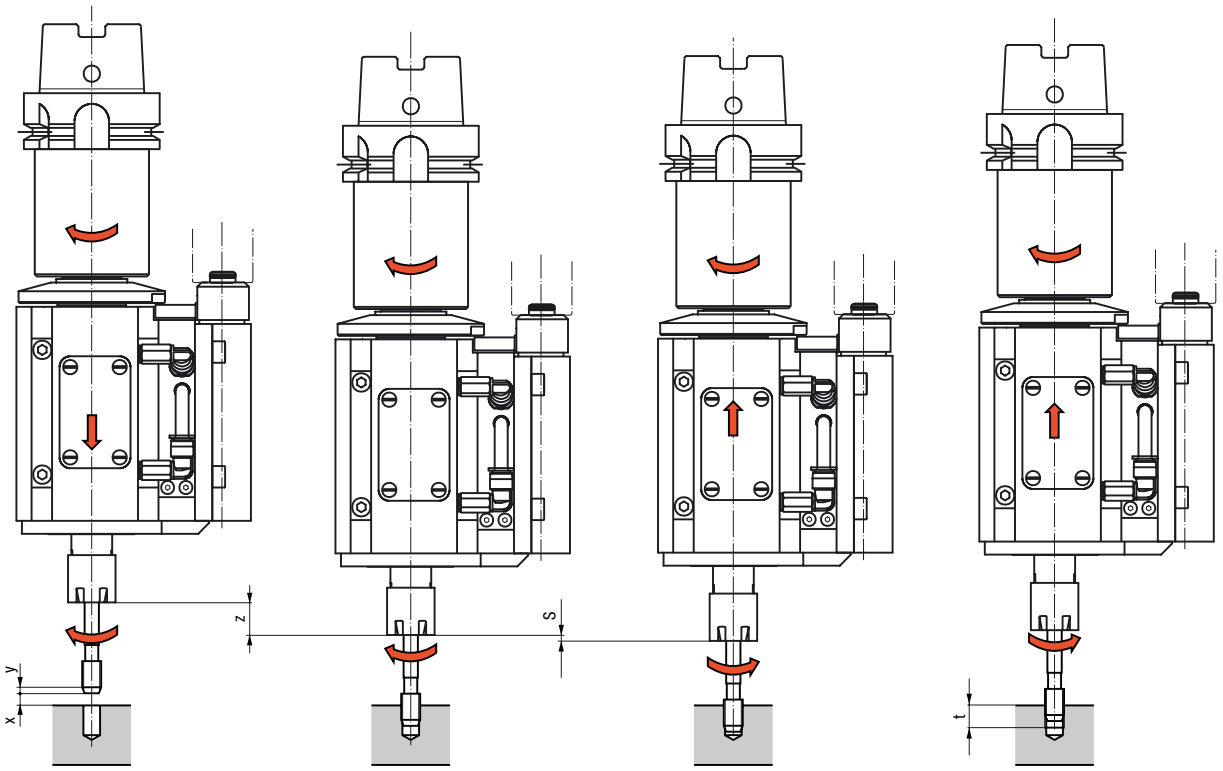
$$z \approx y + x + t - 0.5\ G$$

z = travel
y = chamfer length of tap or lead taper length of roll form tap
x = safety distance
t = thread depth to be produced
G = disengaging distance

Recommended safety distance: min. 0.5512 (14 mm)

The travel depends on factors like speed and the material to be machined, and must be corrected accordingly in case of need.

SWITCH-MASTER® Thread production cycle



= Spindle movement in axial direction

= Rotation of the tool

Example for the travel z to be programmed:

$$z \approx y + x + t - 0.5\ G$$

z = travel
y = chamfer length of tap or lead taper length of roll form tap
x = safety distance 0.1969 (5 mm)
t = thread depth to be produced
S = gear change path = 0.1181 (3 mm)

Ordering Information

1. Order GRN-NC housing based on tap capacity tap sizes No. 8 to 1/2 for GRN-NC 20 & 5/16 to 13/16 for GRN-NC 32
2. Order stop arm 65 mm, 80 mm, Fadal or Haas stop arm, bolts to side of GRN-NC with 4 socket head cap screws screws included with stop arm. (DIN. STD 65 mm with 40 taper and 80 mm with 50 taper)
3. Order CAT/BT V-Flange
4. Order ER-GB square drive collets from page 298-299
5. Order coolant seal disc if required

Notes/Advantages

Coolant seal disc nut with GRN-NC/HD (Hi-Q/ERC).

35/37 gear ratio for ease of programming now inclusive to EMUGE

Aluminium applications reduce max rpm by 10% to increase life of unit; steel / cast iron reduce max rpm by 20%

GRN-NC are to be applied on CNC machines in low to mid volume production applications. For high volume / high production we would apply the SWITCH-MASTER®

EMUGE Full Speed taps not recommended in GRN-NC units. Run with conventional tap feeds and speeds.

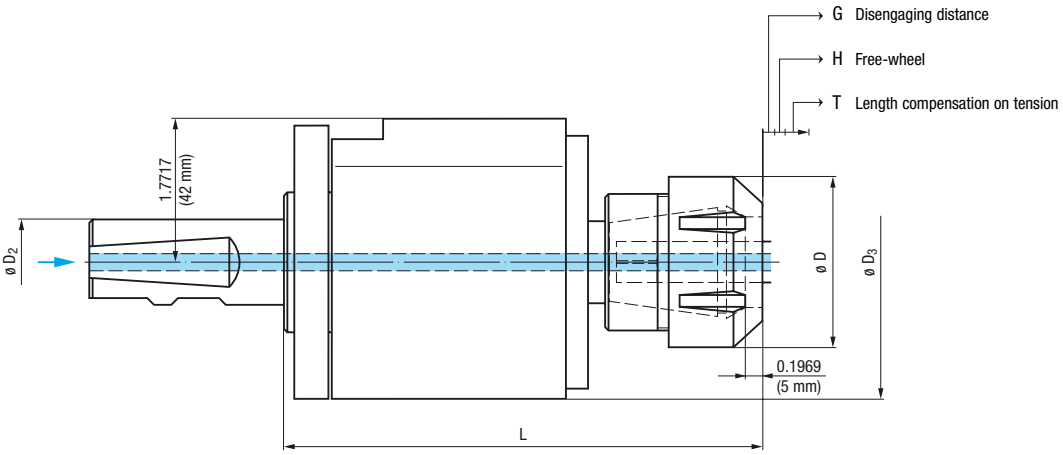
Expected life of unit between 50,000 and 100,000 cycles before servicing units. Can be repaired / serviced at EMUGE West Boylston, MA. Facilities for a flat fee.

For non-coolant thru the spindle applications coolant tube should be removed. You can also order a non coolant GRN-NC unit at approx less $300.00 US list price off GRN-NC 20/HD housing. Delivery would be 3 to 4 weeks.

Programming

1. Use G85 bore cycle or G01 only
2. Feed rate at 95% only in and out
3. Depth of hole – self feed (0.150) tap one hole and check for depth. Add to controller the additional distance required in Z axis to obtain correct depth of hole.
4. Clearance plane 0.400 (10 mm)
5. Disable spindle and feed override M49 to disable and M48 to turn back on
6. Note: Fadal only you will also need to cancel accel/decel feed ramps (cancel G8) G9 to re-activate.

With internal coolant-lubricant supply



Tapping attachment with collet head.

With length compensation on tension only.

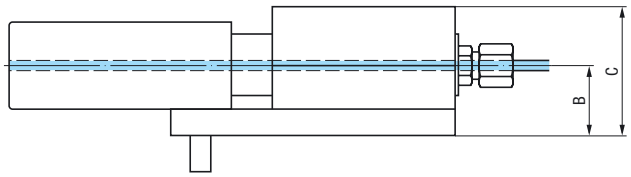
IKZ

pmax 700psi (50bar)

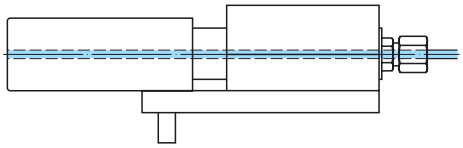
T

ER(GB)

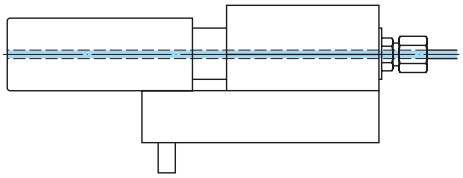
Type			EDP Number	
GRN-NC 20	GRN-NC 20	1" (W/O stop arm assy)	**FT32523E**	★
GRN-NC 20/HD	GRN-NC 20/HD	1" (W/O stop arm assy)	**FT32511E**	★
GRN-NC 32	GRN-NC 32	1" (W/O stop arm assy)	**FT32524E**	★
GRN-NC 32/HD	GRN-NC 32/HD	1" (W/O stop arm assy)	**FT32525E**	★



65 mm Stop Arm

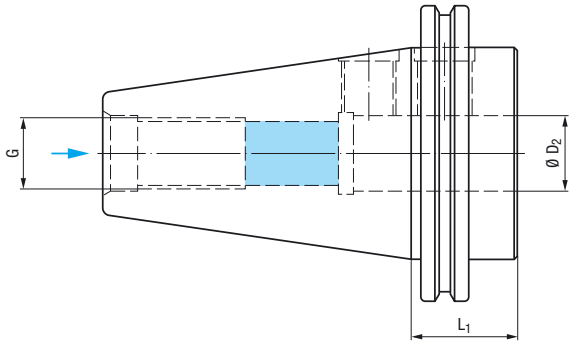


85 mm Stop Arm

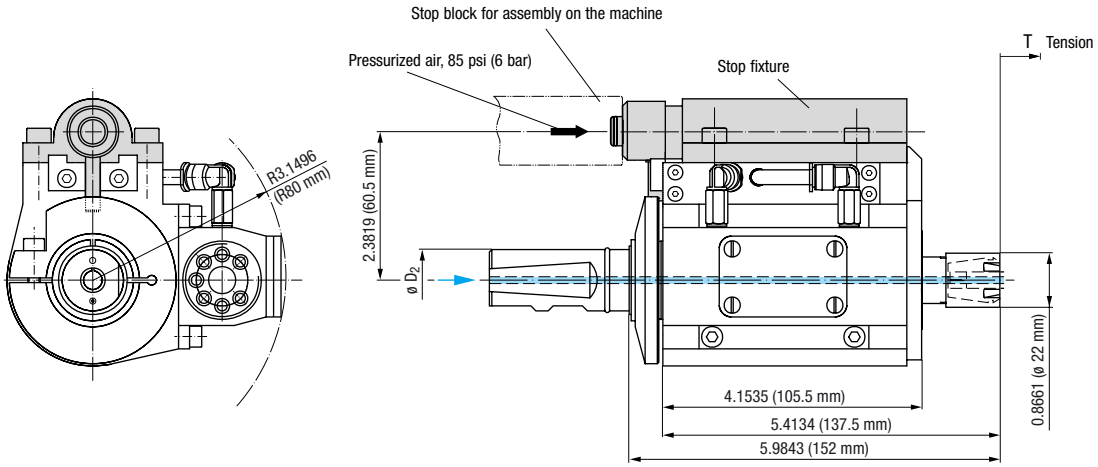


Item Description	B	C	EDP Number	
GRN-NC Stop arm ASSY 65 mm offset	23	39	**FT395065E**	★
GRN-NC Stop arm ASSY 80 mm offset	38	54	**FT395080E**	★
GRN-NC/11 Fadal stop arm offset			**FT392555EF**	★
GRN-NC/20 Fadal Stop arm offset	13		**FT395055EF**	★
GRN-NC/20 Hass Stop arm offset	23		**FT395065EH**	★
Turning of stop arm per specs.			**Stoparmadapt**	★

Note: 1. If EMUGE is to turn down stop arm to fit customer stop block dimensions there will be an additional change.
Contact EMUGE for the cost to turn the stop arm requirement. If customer to turn down stop block see drawing page 241.
2. The above stop arms used for both GRN-NC 20 and GRN-NC 32 sizes.
3. GRN-NC 20/HD and GRN-NC 32/HD includes Rego-Fix Hi-Q/ERC coolant seal disc nut.



Item Description	EDP Number	
CAT 40 Adapter shank W/1" bore	**FT23951E**	★
CAT 50 Adapter shank W/1" bore	**FT23953E**	★
BT 40 Adapter shank	**FT23952E**	★



Tapping attachment with collet head.

With length compensation on tension only.

IKZ

p_{max} 700psi (50bar)

T

ER(GB)

Type			Shank Size ø D_2 DIN 1835 B+E	Speed/rpm max.	mm T	Weight (lbs)	EDP Number	
SWITCH-MASTER 16 MV 90°	M4 - M12	ER 16 (GB)	25	3000	9	8.16	**F3381392**	★

The tapping attachment requires auxiliary energy = pressurized air 85^{+14}_{-7} psi ($6^{+1}_{-0.5}$ bar) for reversing

Collets and sealing disks see page 298-307, please order separately

Adapter shank, stop block and stop fixture are not included in the delivery, please order separately

The transfer of pressurized air is effected by means of a special stop block mounted on the machine, and into which the stop fixture engages

GRN-NC SWITCH-MASTER

Tapping attachment with collet head.

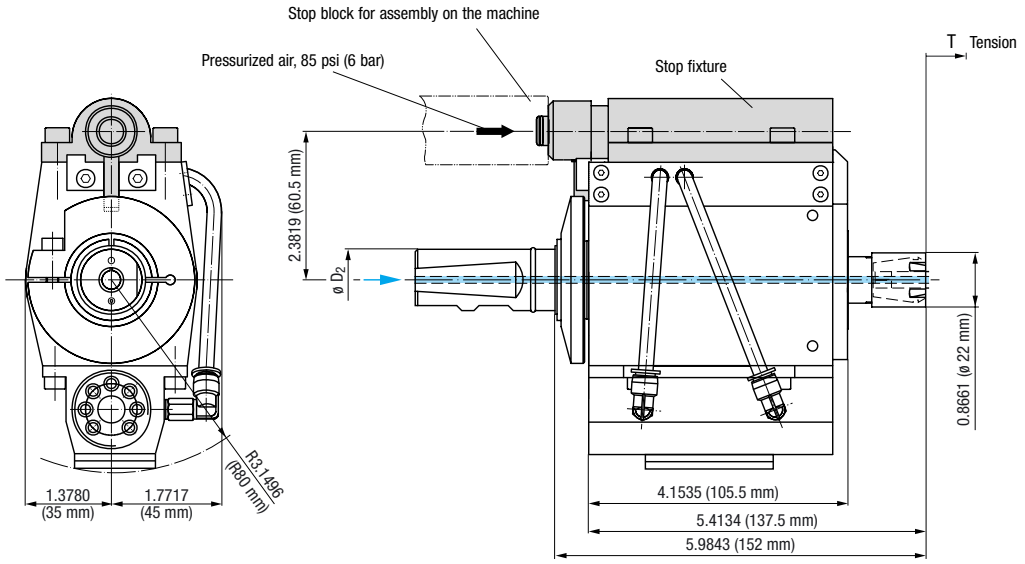
With length compensation on tension only.

IKZ

pmax 700psi (50bar)

T

ER(GB)



Type			Shank Size ø D_2 DIN 1835 B+E	Speed/rpm max.	mm T	Weight (lbs)	EDP Number	
SWITCH-MASTER 16 MV 180°	M4 - M12	ER 16 (GB)	25	3000	9	8.16	**F3381397**	★

The tapping attachment requires auxiliary energy = pressurized air 85^{+14}_{-7} psi ($6^{+1}_{-0.5}$ bar) for reversing

Collets and sealing disks see page 298-307, please order separately

Adapter shank, stop block and stop fixture are not included in the delivery, please order separately

The transfer of pressurized air is effected by means of a special stop block mounted on the machine, and into which the stop fixture engages