

- Suitable for torques from 0,058 to 16,27 Nm
- Rotation angles from 90° to 270°
- Modern compact design



### Technical Data

#### Medium:

Compressed air, filtered, lubricated and non-lubricated

#### Operation:

Double acting rotary vane with buffer cushioning

M/60280 to M/60284 single vane  
M/60284/TI double vane

#### Operating Pressure:

3 to 7 bar M/60280, M/60281  
2 to 7 bar M/60282, M/60283  
2 to 10 bar M/60284, M/60284/TI

#### Operating Temperature:

+5°C to +60°C

#### Air Connection:

M 5 M/60280, M/60281, M/60282, M/60283  
G 1/8 M/60284, M/60284/TI

#### Rotation Angle:

90°, 180° M/60280 to M/60283  
90°, 180°, 270° M/60284  
90° M/60284/TI

#### Rotation Angle Tolerance:

0 to +4° M/60280 to M/60283  
0 to +3° M/60284, M/60284/TI

#### Other Features:

Featherkeys supplied as standard parts

#### Materials:

Cast aluminium housing, steel shaft, sintered bronze shaft bearings, nitrile rubber seals.

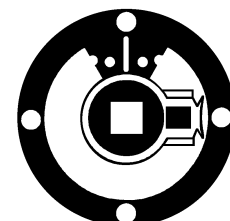
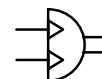
### Ordering Information

To order a Rotary Vane Actuator with torque up to 0,9 Nm at 6 bar and a 180° rotation quote: M/60282/180

To order a Rotary Vane Actuator with torque up to 9 Nm at 6 bar and a 90° rotation quote: M/60284/TI/90

To order mounting brackets refer to appropriate actuator mounting table.

End position detection available on request





Theoretical Torques • Forces • Air Consumption • Weights of Actuator and Mountings (kg)

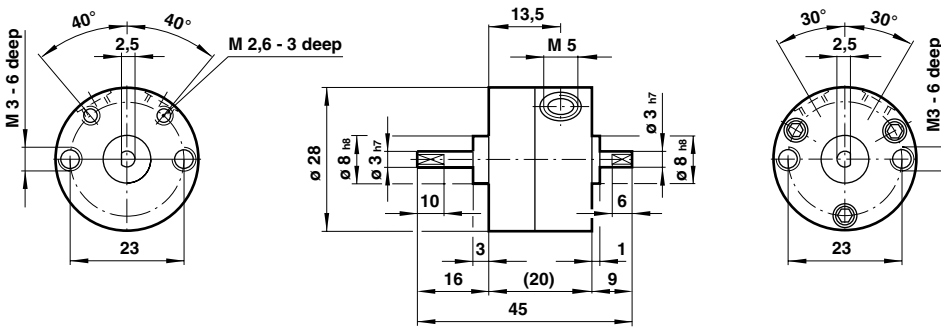
Model	Theoretical torques at 6 bar (Nm)	Permissible forces*		Permissible rotation energy** (Nm)	Maximum frequency*** (1/min)	Air consumption (cm <sup>3</sup> )			Weight (kg)	Style 'B', 'G'	Style 'C'
		axial (N)	radial (N)			90°	180°	270°			
M/60280	0,13	0,98	9,8	$0,29 \times 10^{-3}$	180 (at 180°)	0,5	1	-	0,04	0,01	0,02
M/60281	0,35	3,92	39,2	$1,47 \times 10^{-3}$	160 (at 180°)	2,4	2,6	-	0,07	0,02	0,04
M/60282	1,04	3,92	49	$2,94 \times 10^{-3}$	150 (at 180°)	5	8,5	-	0,14	0,03	0,05
M/60283	1,91	24,5	294	$14,7 \times 10^{-3}$	120 (at 180°)	12	16	-	0,36	0,05	0,09
M/60284	4,02	29,4	392	$24,5 \times 10^{-3}$	70 (at 270°)	37	37	43	0,47	0,10	0,20
M/60284/TI	9,31	29,4	392	$24,5 \times 10^{-3}$	200 (at 90°)	34	-	-	0,48	0,10	0,20

\* Permissible load on rotary vane shaft

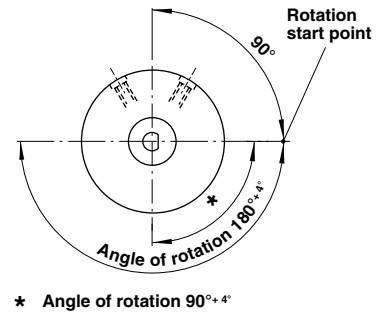
\*\* Permissible rotational energy in Nm which may be applied to shaft. It can be calculated as follows: Permissible rotational energy  $\geq 1/2 I \omega^2$ , I=Angular moment,  $\omega$ =Mean angular velocity

\*\*\* Maximum frequency at 5 bar pressure, no load.

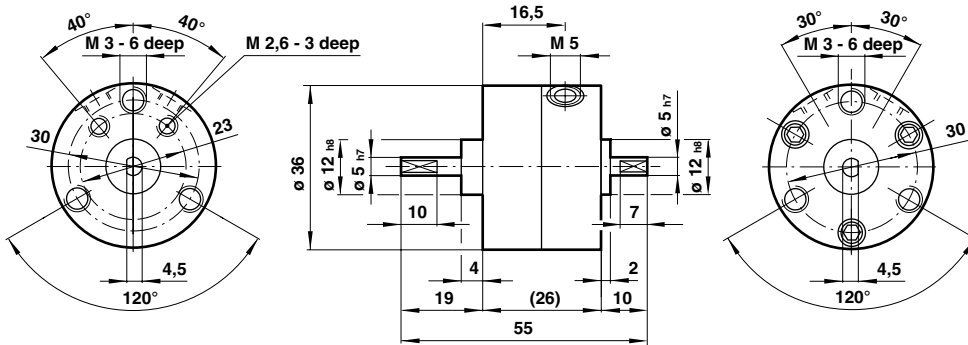
Basic Dimensions M/60280



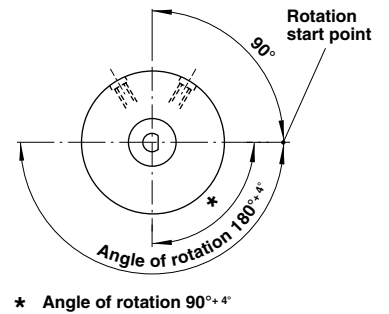
Rotation Start Point



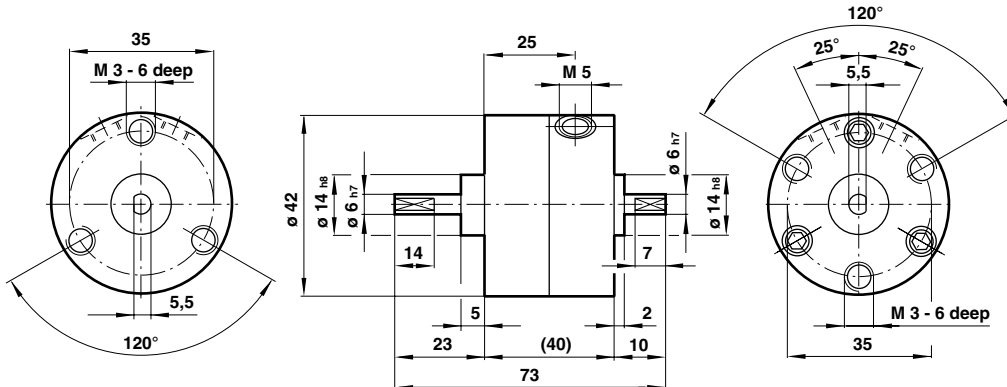
Basic Dimensions M/60281



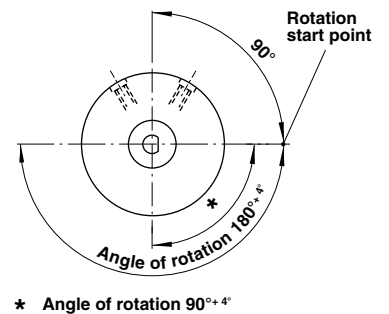
Rotation Start Point



Basic Dimensions M/60282



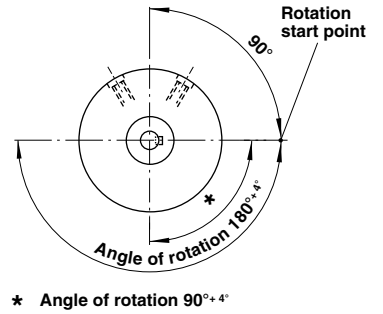
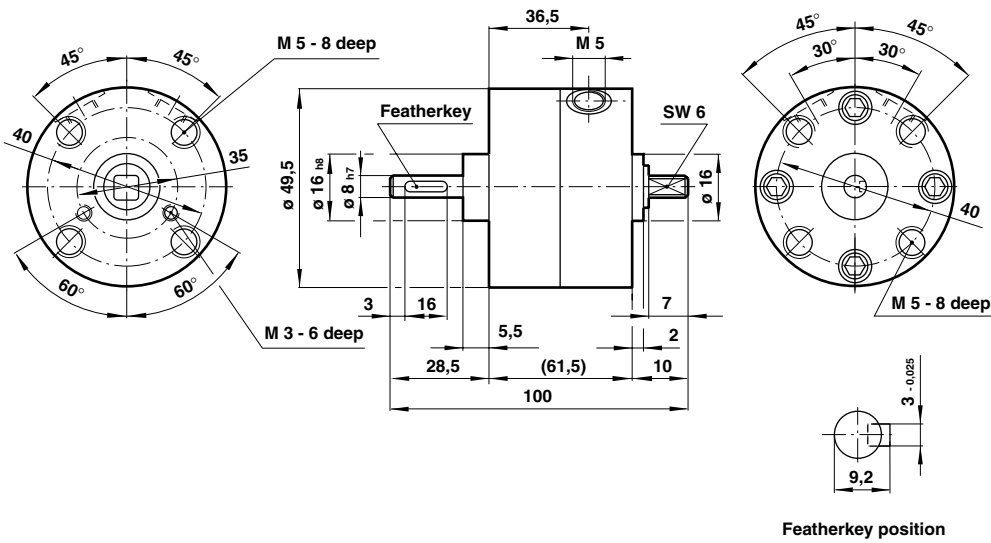
Rotation Start Point





### Basic Dimensions M/60283

### Rotation Start Point

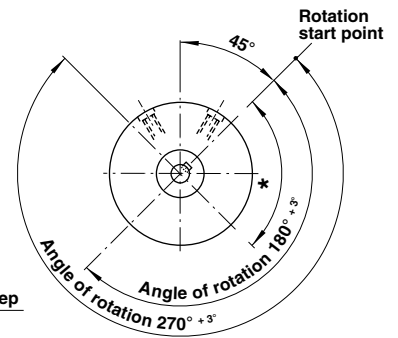
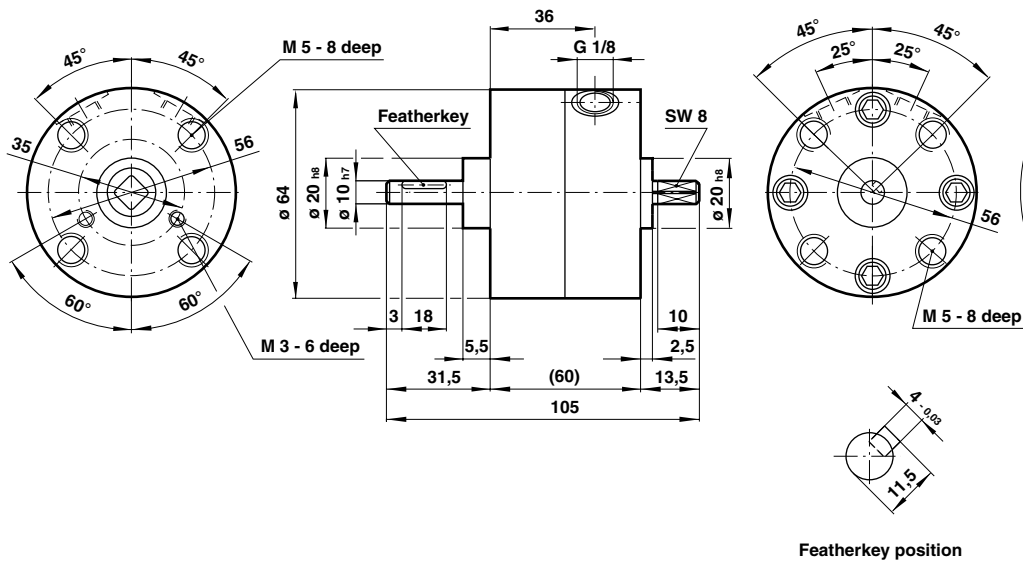


\* Angle of rotation 90° ± 4°

Featherkey position

### Basic Dimensions M/60284 and M/60284/TI

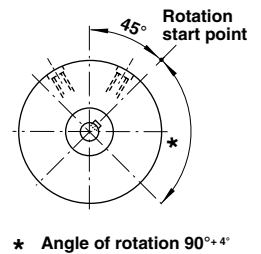
### Rotation Start Point M/60284



\* Angle of rotation 90° ± 3°

Featherkey position

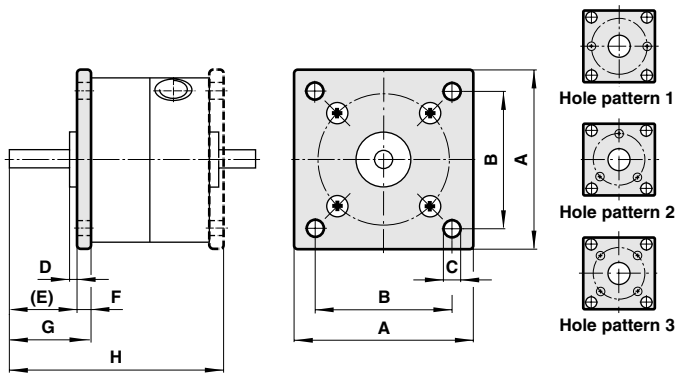
### M/60284/TI



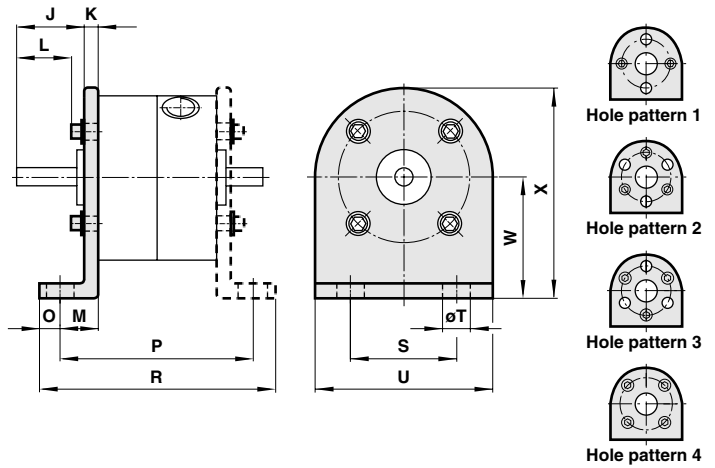
\* Angle of rotation 90° ± 4°



### Rear Flange Mounting Style 'B', Front Flange Mounting Style 'G'



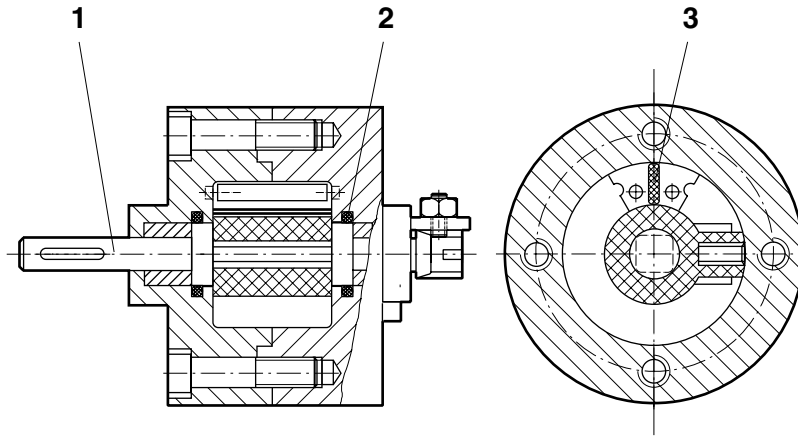
### Foot Mounting Style 'C'



Model 'B', 'G'	QM/60280/22	QM/60281/22	QM/60282/22	QM/60283/22	QM/60284/22	Model 'C'	QM/60280/21	QM/60281/21	QM/60282/21	QM/60283/21	QM/60284/21
Actuator	60280	60281	60282	60283	60284	Actuator	60280	60281	60282	60283	60284
A	30	37	42	50	64	J	14	16,5	20	25	27
B	24	30	34	41	52	K	2	2,5	3	3,5	4,5
∅ C	3,4	3,4	3,5	5,5	5,5	L	10,5	12,5	16	18,5	20,5
D	1	1,5	2	2	2	M	10	11	12	15	18
E	14	16,5	20	25	28	O	5	7	8	10	12
F	2	2,5	3	3,5	3,5	P	40	48	64	91,5	96
G	16	19	23	28,5	31,5	R	50	62	80	111,5	120
H	38	47,5	65	93,5	95	S	20	26	30	36	48
Hole pattern	1	2	2	3	3	∅ T	4,8	4,8	5,8	7	6,5
Rotation*	180°	120°	120°	90°	90°	U	30	36	42	49	66
						W	22	25	30	34	42
						X	37	43	51	58,5	75
						Hole pattern	1	2	3	4	4
						Rotation*	90°	60°	60°	90°	90°

\* The mountings can be rotated through the angle shown.

### Spares



Model	Spares kit	Model	Spares kit	Comprising: Item	Description	Quantity
M/60280	QM/60280/00	M/60283	QM/60283/00	1	Shaft with vane	1
M/60281	QM/60281/00	M/60284	QM/60284/00	2	O-ring	2
M/60282	QM/60282/00	M/60284/TI	QM/60284/TI/00	3	Seal	1 (2)

( ) for .../TI

### Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under 'Technical Data'.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult NORGREN.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes.

The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

**System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.**

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products.