

# M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles



Compact design  
 Suitable for torques from 0,058 to 402,46 Nm  
 Fixed and adjustable rotation angles  
 Single and double vane construction

## TECHNICAL DATA

### Medium:

Compressed air, filtered, lubricated or non-lubricated

### Operation:

Double acting rotary vane with buffer cushioning

M/60280 - M/60288 and IE models - single vane

M/60284/TI - M/60288/TI and TE models - double vane

### Operating pressure:

2 ... 10 bar

3 ... 7 bar

(M/60280, M/60281, M/60281/IE)

2 ... 7 bar

(M/60282, M/60283, M/60282/IE,)

### Operating temperature:

+5°C ... +60°C

Consult our Technical Service for use below +2°C

### Rotation tolerance:

0° ... +4°: M/60280 - M/60283

0° ... +3°: M/60284 - M/60288,

M/60284/TI - M/60288/TI

-9° ... +3°: M/60281/IE - M/60284/IE, M/60284/TE

## MATERIALS

Body: cast aluminium




Shaft: steel

Shaft bearing: sintered bronze

Seals: nitrile rubber

## STANDARD MODELS

Mini rotary vane actuators - Models with fixed or adjustable rotation angles

Port size	Single vane	Double vane	Rotation angle			MODELS	ACCESSORIES	
			90°	180°	270°		Straight fitting	Elbow fitting
							Tube diameter in bold	
								
M5	•		•	•		M/60280/*	C02250405	C02470405
M5	•		•	•		M/60281/*	C02250405	C02470405
M5	•			• <sup>*1</sup>		M/60281/IE	C02250405	C02470405
M5	•		•	•		M/60282/*	C02250405	C02470405
M5	•			• <sup>*1</sup>		M/60282/IE	C02250405	C02470405
G 1/8	•		•	•		M/60283/*	C02250618	C02470618
G 1/8	•			• <sup>*1</sup>		M/60283/IE	C02250618	C02470618
G 1/8	•		•	•		M/60284/*	C02250618	C02470618
G 1/8	•				• <sup>*2</sup>	M/60284/IE	C02250618	C02470618
G 1/8		•	•			M/60284/TI	C02250618	C02470618
G 1/8		•	• <sup>*3</sup>			M/60284/TE	C02250618	C02470618

\* Insert rotation angle in degrees. <sup>\*1</sup> Adjustable from 30° ... 180° <sup>\*2</sup> Adjustable from 30° ... 270° <sup>\*3</sup> Adjustable from 30° ... 90°

Other fittings are available, please see section 7

Rotary vane actuators - Models with fixed rotation angles

Port size	Single vane	Double vane	Rotation angle			MODELS	ACCESSORIES	
			90°	180°	270°		Straight fitting	Elbow fitting
							Tube diameter in bold	
G 1/8	•		•	•	•	M/60285/*	C0225 <b>06</b> 18	C0247 <b>06</b> 18
G 1/8		•	•	•	•	M/60285/TI	C0225 <b>06</b> 18	C0247 <b>06</b> 18
G 1/4	•		•	•	•	M/60286/*	C0225 <b>06</b> 28	C0247 <b>06</b> 28
G 1/4		•	•	•	•	M/60286/TI	C0225 <b>06</b> 28	C0247 <b>06</b> 28
G 3/8	•		•	•	•	M/60287/*	C0225 <b>08</b> 38	C0247 <b>08</b> 38
G 3/8		•	•	•	•	M/60287/TI	C0225 <b>08</b> 38	C0247 <b>08</b> 38
G 1/2	•		•	•	•	M/60288/*	C0225 <b>08</b> 48	C0247 <b>08</b> 48
G 1/2		•	•	•	•	M/60288/TI	C0225 <b>08</b> 48	C0247 <b>08</b> 48

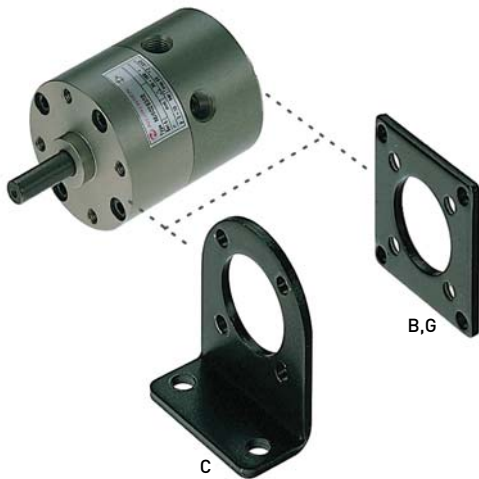


\* Insert rotation angle in degrees

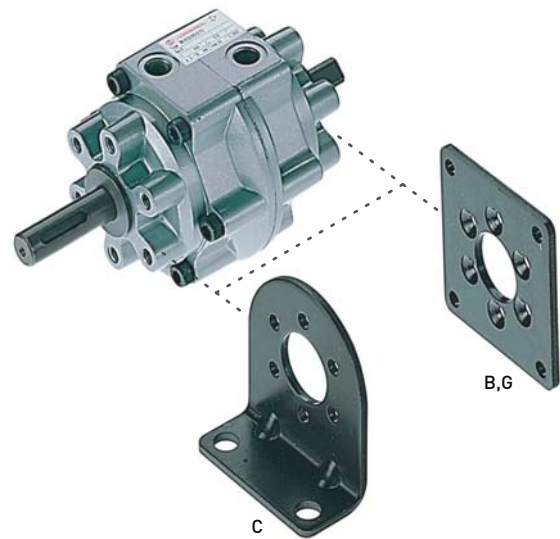
Other fittings are available, please see section 7

MOUNTINGS

M/60280



M/60285



MODELS	B, G	C
M/60280	QM/60280/22	QM/60280/21
M/60281, .../TI	QM/60281/22	QM/60281/21
M/60282, .../TI	QM/60282/22	QM/60282/21
M/60283, .../TI	QM/60283/22	QM/60283/21
M/60284, .../TI	QM/60284/22	QM/60284/21

MODELS	B, G	C
M/60285, .../TI	QM/60285/22	QM/60285/21
M/60286, .../TI	QM/60286/22	QM/60286/21
M/60287, .../TI	-	QM/60287/21
M/60288, .../TI	-	QM/60288/21

# M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles

## THEORETICAL FORCES, AIR CONSUMPTION, ACTUATORS WEIGHT (KG)

MODELS	Theoretical torque at 6 bar (Nm)	Permissible forces <sup>*1)</sup> axial (N)	radial (N)	Permissible rotation energy <sup>*2)</sup> (Nm)	Maximum frequency <sup>*3)</sup> (1/min)	Air consumption (cm <sup>3</sup> )			Weight (kg)
						90°	180°	270°	
M/60280	0,15	3	30	0,6 x 10 <sup>-3</sup>	180 (at 180°)	1,4	1,4	-	0,04
M/60281	0,38	4	40	1,5 x 10 <sup>-3</sup>	150 (at 180°)	3,4	3,4	4	0,07
M/60281/TI	0,86	4	40	1,5 x 10 <sup>-3</sup>	240 (at 90°)	2,8	-	-	0,08
M/60282	1,20	4	50	3,0 x 10 <sup>-3</sup>	150 (at 180°)	9,8	9,8	12	0,14
M/60282/TI	2,54	4	50	3,0 x 10 <sup>-3</sup>	240 (at 90°)	8,1	-	-	0,14
M/60283	2,10	25	300	15,0 x 10 <sup>-3</sup>	120 (at 180°)	17	17	21	0,25
M/60283/TI	4,70	25	300	15,0 x 10 <sup>-3</sup>	180 (at 90°)	15	-	-	0,26
M/60284	4,10	30	400	25,0 x 10 <sup>-3</sup>	90 (at 180°)	37	37	43	0,47
M/60284/TI	9,50	30	400	25,0 x 10 <sup>-3</sup>	180 (at 90°)	34	-	-	0,48

MODELS	Theoretical torque at 6 bar (Nm)	Permissible forces <sup>*1)</sup> axial (N)	radial (N)	Permissible rotation energy <sup>*2)</sup> (Nm)	Maximum frequency <sup>*3)</sup> (1/min)	Air consumption (cm <sup>3</sup> )			Weight (kg)
						90°	180°	270°	
M/60281/IE	0,38	4	40	1,0 x 10 <sup>-3</sup>	180 (at 180°)	4	-	-	0,09
M/60282/IE	1,20	4	50	2,0 x 10 <sup>-3</sup>	150 (at 180°)	12	-	-	0,17
M/60283/IE	2,10	25	300	3,0 x 10 <sup>-3</sup>	120 (at 180°)	21	-	-	0,28
M/60284/IE	4,10	30	400	7,0 x 10 <sup>-3</sup>	60 (at 270°)	43	-	-	0,51
M/60284/TE	9,50	30	400	7,0 x 10 <sup>-3</sup>	180 (at 90°)	34	-	-	0,53

MODELS	Theoretical torques at 6 bar (Nm)	Permissible forces <sup>*1)</sup> axial (N)	radial (N)	Permissible rotation energy <sup>*2)</sup> (Nm)	Maximum frequency <sup>*3)</sup> (1/min)			Air consumption (cm <sup>3</sup> )			Weight (kg)		
					90°	180°	270°	90°	180°	270°	90°	180°	270°
M/60285	5,8	44,1	588	49 x 10 <sup>-3</sup>	180	90	60	51	51	61	0,82	0,79	0,73
M/60285/TI	12,8				180			42			0,82		
M/60286	18,0	88,2	1176	225,4 x 10 <sup>-3</sup>	120	78	48	146	146	179	2,00	1,90	1,70
M/60286/TI	41,5				120			127			2,00		
M/60287	34,5	147	1960	1078 x 10 <sup>-3</sup>	90	60	42	244	283	352	3,70	3,70	3,70
M/60287/TI	83,0				90			244			4,30		
M/60288	123,0	490	4900	3920 x 10 <sup>-3</sup>	66	45	30	754	869	1036	12,70	12,20	11,20
M/60288/TI	247,0				66			754			12,70		

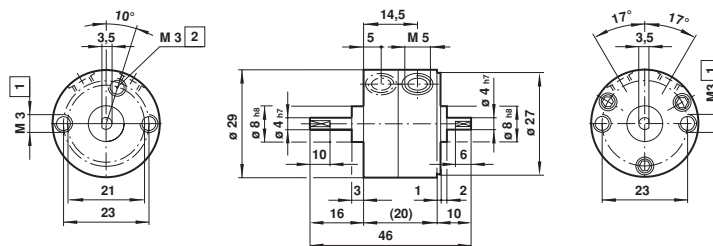
\*1) Permissible load on rotary vane shaft

\*2) 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

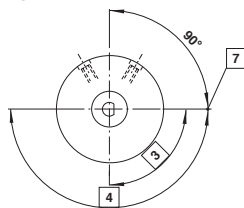
\*3) Maximum frequency at 5 bar pressure, no load

## BASIC DIMENSIONS

M/60280



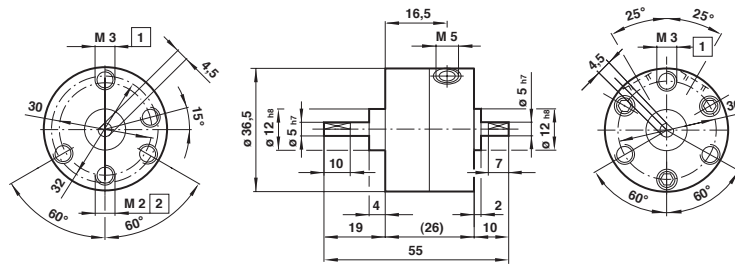
## ROTATION START POINT



- 1 6 deep
- 2 3,5 deep
- 3 Rotation angle 90° + 4°
- 4 Rotation angle 180° + 4°
- 7 Rotation start point

## BASIC DIMENSIONS

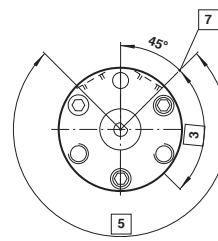
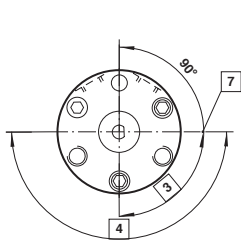
M/60281



## ROTATION START POINT

M/60281/90, M/60281/180

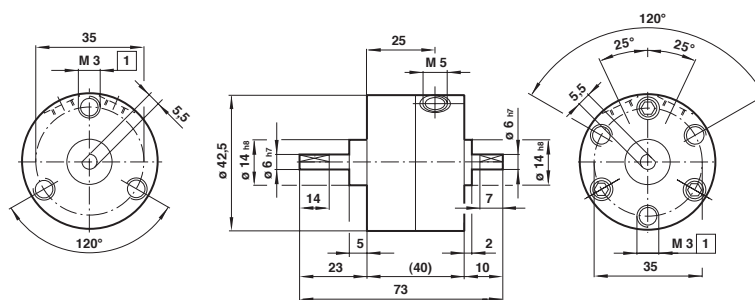
M/60281/270, M/60281/TI



- 1** 6 deep
- 2** 3 deep
- 3** Rotation angle  $90^\circ + 4^\circ$
- 4** Rotation angle  $180^\circ + 4^\circ$
- 5** Rotation angle  $270^\circ + 4^\circ$
- 7** Rotation start point

## BASIC DIMENSIONS

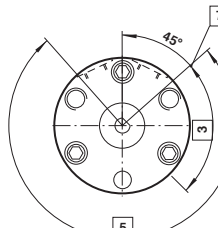
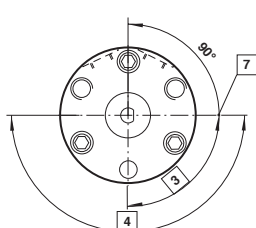
M/60282



## ROTATION START POINT

M/60282/90, M/60282/180

M/60282/270, M/60282/TI

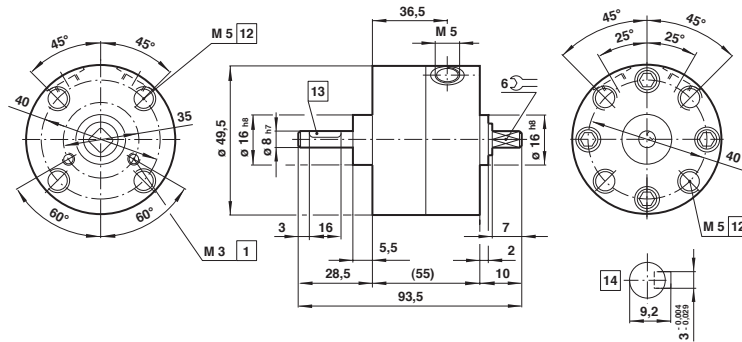


# M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles

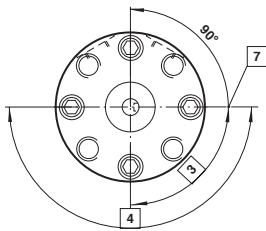
## BASIC DIMENSIONS

M/60283

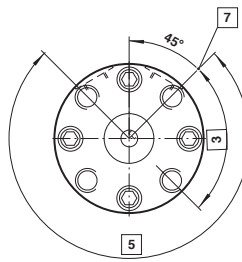


## ROTATION START POINT

M/60283/90, M/60283/180



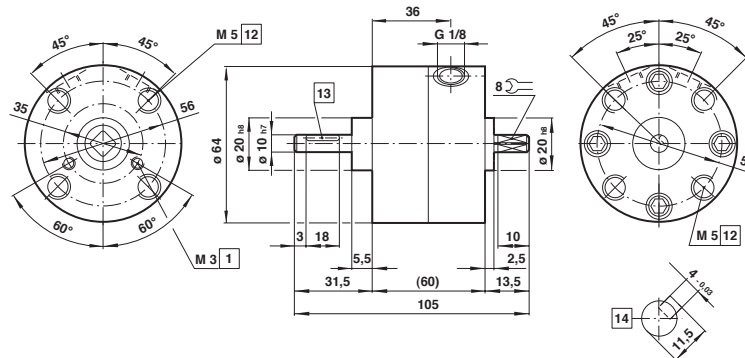
M/60283/270, M/60283/TI



- 1 6 deep
- 3 Rotation angle 90° + 4°
- 4 Rotation angle 180° + 4°
- 5 Rotation angle 270° + 4°
- 7 Rotation start point
- 12 8 deep
- 13 Featherkey
- 14 Featherkey situation

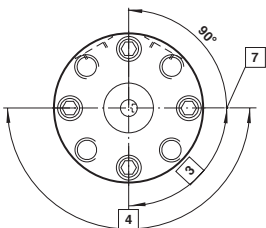
## BASIC DIMENSIONS

M/60284

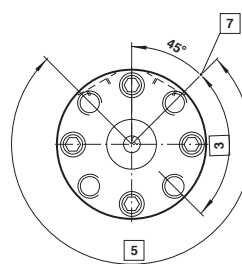


## ROTATION START POINT

M/60284/90, M/60284/180



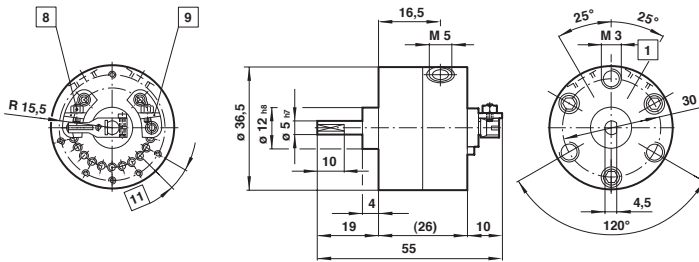
M/60284/270, M/60284/TI



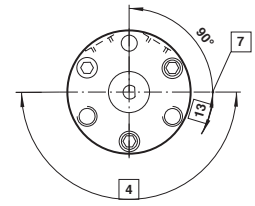
- 1 6 deep
- 3 Rotation angle 90° + 4°
- 4 Rotation angle 180° + 4°
- 5 Rotation angle 270° + 4°
- 7 Rotation start point
- 12 8 deep
- 13 Featherkey
- 14 Featherkey situation

## BASIC DIMENSIONS

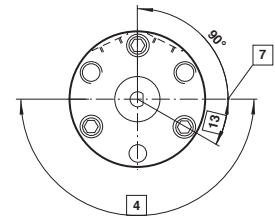
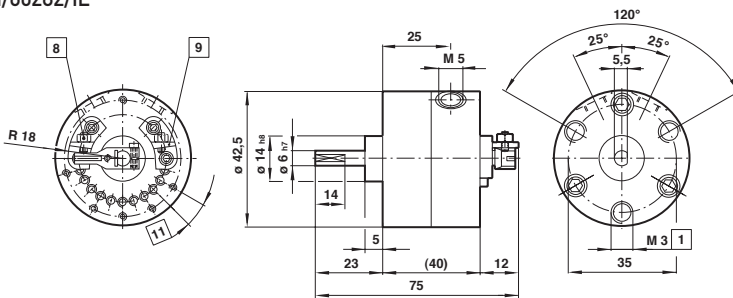
M/60281/IE



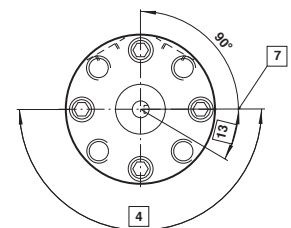
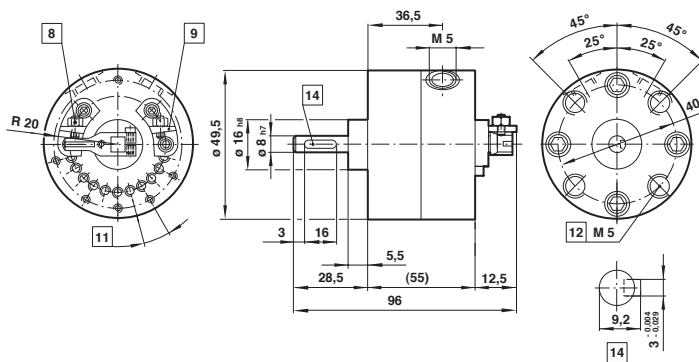
## ROTATION START POINT



## M/60282/IE



## M/60283/IE



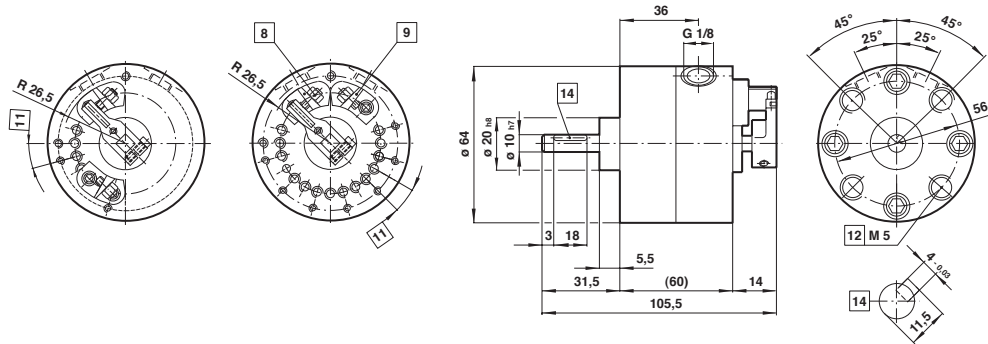
- 1** 6 deep
- 4** Rotation angle 180° max
- 7** Rotation start point
- 8** Rotation angle fine adjustment
- 9** Angle setting stop
- 11** Angle of rotation setting range 15°
- 12** 8 deep
- 13** Rotation angle 30° min
- 14** Featherkey situation

# M/60280 Rotary vane actuators

Double acting - 30° ... 270° rotation angles

## BASIC DIMENSIONS

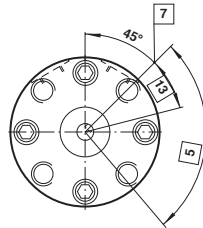
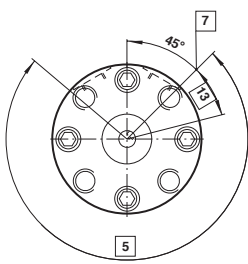
M/60284/IE & M/60284/TE



## ROTATION ANGLE START POINT

M/60284/IE

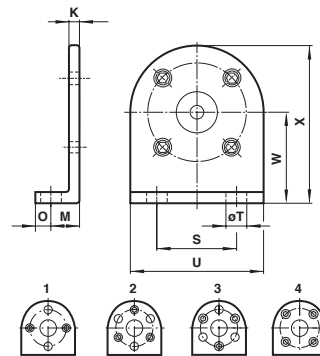
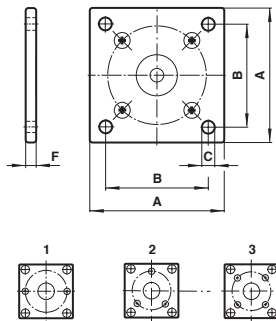
M/60284/TE



- 1 6 deep
- 3 Rotation angle 90° max
- 5 Rotation angle 270° max
- 7 Rotation start point
- 8 Rotation angle fine adjustment
- 9 Angle setting stop
- 11 Angle of rotation setting range 15°
- 12 8 deep
- 13 Rotation angle 30° min
- 14 Featherkey situation

Rear flange - B, front flange - G

Foot - C



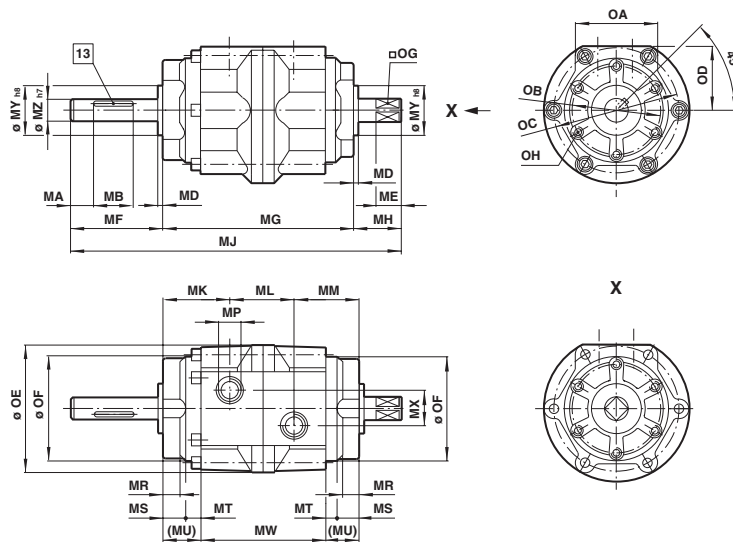
MODELS	A	B	Ø C	F	Hole pattern	Rotation angle	kg
QM/60280/22	30	24	3,4	2	1	180°	0,04
QM/60281/22	37	30	3,4	2,5	2	120°	0,07
QM/60282/22	42	34	3,5	3,0	2	120°	0,14
QM/60283/22	50	41	5,5	3,5	3	90°	0,36
QM/60284/22	64	52	5,5	3,5	3	90°	0,47

MODELS	K	M	O	S	Ø T	U	W	X	Hole pattern	Rotation angle	kg
QM/60280/21	2	10	5	20	4,8	30	22	37	1	90°	0,04
QM/60281/21	2,5	11	7	26	4,8	36	25	43	2	60°	0,05
QM/60282/21	3,0	12	8	30	5,8	42	30	51	3	60°	0,09
QM/60283/21	3,5	15	10	36	7	49	34	58,5	4	90°	0,20
QM/60284/21	4,5	18	12	48	6,5	66	42	75	4	90°	0,20

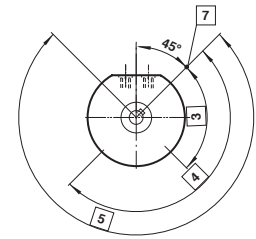
The mountings can be rotated through the angle shown

## BASIC DIMENSIONS

M/60285 ... M/60288



## ROTATION START POINT

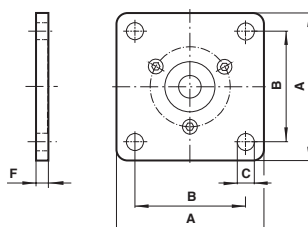


- 3** Rotation angle 90° +3°
- 4** Rotation angle 180° +3°
- 5** Rotation angle 270° +3°
- 7** Rotation start point
- 13** Featherkey

MODELS	MA	MB	MD	ME	MF	MG	MH	MJ	MK	ML	MM	MP	MR	MS	MT	MU
M/60285/ .../TI	5	20	2,5	13	39,5	86	19,5	145	29	28	29	G1/8	11	14	6	20
M/60286/ .../TI	5	36	3	16	53,5	103	23,5	180	34,5	34	34,5	G1/4	10,5	15,5	8	23,5
M/60287/ .../TI	5	40	3,5	22	65	125	30	220	41,5	4	41,5	G3/8	13	17,5	10	27,5
M/60288/ .../TI	10	40	4,5	35	69,5	171	44,5	285	53,5	64	53,5	G1/2	14,5	21	11,5	32,5
MODELS	MW	MX	Ø MY <sub>h8</sub>	Ø MZ <sub>h7</sub>	OA	Ø OB	Ø OC	OD	Ø OE	Ø OF	OG-0,1	OH	Featherkey	kg		
M/60285/ .../TI	46	16	25	12	44	45	68	36	79	58	10	M6 x 9*	4 -0,03 x 2,5 + 0,1*	0,82		
M/60286/ .../TI	56	24	30	17	61	70	97	51	110	85,5	13	M8 x 12*	5 -0,03 x 3 + 0,1*	2,0		
M/60287/ .../TI	70	32	45	25	78	80	125	66	141,5	110	19	M10 x 15*	7 -0,038 x 4 + 0,2*	4,3		
M/60288/ .../TI	106	44	70	40	110	120	173	90	196	152	32	M12 x 18*	12 -0,043 x 5 + 0,2*	12,7		

\* Deep

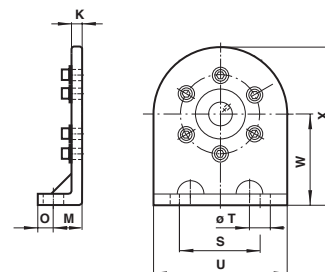
## Rear flange - B, front flange - G



MODELS	A	B	Ø C	F	Rotation angle * <sup>2)</sup>	kg
QM/60285/22	80	64	7	4,5	60°	0,20
QM/60286/22	110	88	9	6	60°	0,51

<sup>2)</sup> The mountings can be rotated through the angle shown

## Foot - C



MODELS	K	M	O	S	Ø T	U	W	X	Rotation angle *	kg
QM/60285/21	4,5	25	10	55	11	75	45	82,5	60°	0,26
QM/60286/21	10	28	12	80	13	110	65	115	60°	1,14
QM/60287/21	12	32	13	100	15	140	80	135	60°	1,24
QM/60288/21	15	35	15	140	15	200	110	200	60°	4,45

\* The mountings can be rotated through the angle shown