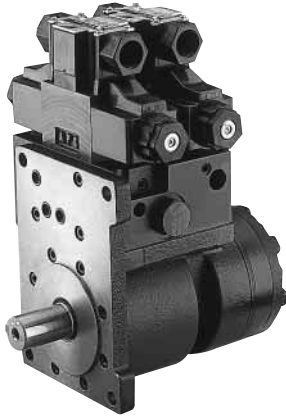


Positioning motor (TM series)



Features

- **Oil hydraulic mechanism**
The system deciding a revolution's position of hydraulic mechanism developed by our own technologies based on the orbit motor of low speed with high torque and low noise.
- **Small & compact**
Built in the mechanism concerning to a revolution, reducing speed and deciding position of revolution. The small sized unit that all components are integrated into one equipment without piping.
- **Indexing shorten time**
With the good response of the built-up process and with the adoption of the reduction speed cam and the mechanic valve, the precise speed reduction can be obtained. Accordingly, the shock-less cease can be done in a short time without miss-index.
- **High accuracy positioning**
There are three kinds indexing number 1/rev, 2/rev, 3/rev, while there are two kinds of groove shapes for positioning, V groove with high accuracy ($\pm 0.1^\circ$) and R groove with loose angle for an auxiliary positioning urpose.
- **Simple control & Simple handling**
Since it is actuated only by ON/OFF of solenoid valve, the control and handling is vary simple.
- **Any choice of forwarding pitch**
The any choice of forwarding pitch makes it possible to carry out a smooth pitch forwarding.

< Applications >

Machining center ATC system
NC lahte's edged tool base
Auto-loader Pallet changer
Steady dimension's forwarding device

Nomenclature

TM ** * * - * * * * - ** * * - 10
 1 2 3 4 5 6 7 8 9 10 11 12

(1) Model No.

TM: TM positioning motor

(2) Motor capacity

05 : 54cm³/rev
10 : 96cm³/rev
13 : 129cm³/rev
19 : 184cm³/rev

(3) Flange

A : SAE A
B : SAE B
F : Flange piping

(4) Shaft diameter

S : ϕ 20.0 (key width: 6.00 mm) ★1
M : ϕ 25.0 (key width: 7.00 mm)
I : ϕ 25.4 (key width: 6.35 mm)

(5) Indexing number

1 : 1 index/rev.
2 : 2 index/rev.
3 : 3 index/rev.

(6) Cam groove

R : R groove (auxiliary positioning with loose angle)
V : V groove (positioning accuracy: $\pm 0.1^\circ$)

(7) Control port

0 : None
2 : With UN, CL
3 : With UN, CL, CO

(8) Operating pressure

1 : 3.5 MPa {35kgf/cm²} or less
2 : 3.6~5 MPa {36~50kgf/cm²}
3 : 5.1~7 MPa {51~70kgf/cm²}

(9) Solenoid operated valve method ★2

Mark	For revolution	For pulling out pins
AT	KSO-G02-2CA-30-EN	KSO-G02-9CA-30-EN
AF	KSO-G02-2CA-30-CE	KSO-G02-9CA-30-CE
BT	KSO-G02-2CB-30-N	KSO-G02-9CB-30-N
PT	KSO-G02-2CP-30-EN	KSO-G02-9CP-30-EN
XT	LS-G02-2CA-20-EN	LS-G02-9CA-20-EN
XF	LS-G02-2CA-20-CE	LS-G02-9CA-20-CE

(10) CL-port throttling mark

0 : ϕ 1.0 1 : ϕ 2.0
2 : ϕ 1.2 3 : ϕ 2.2
4 : ϕ 1.4 5 : ϕ 2.4
6 : ϕ 1.6
8 : ϕ 1.8 N : None

(11) Proximity switch

K : Provided
N : None
S : None (with detection rod)

(12) Design number (the design number is subject to change)

Note) ★1 Shaft diameter : S is only applied for TM05.

★2 Refer to LS-G02 (page 27) and KSO-G02 (page 29) for the specifications of solenoid operated valves.

Specifications

Model No.	TM05			TM10			TM13			TM19					
Motor capacity	cm ³ /rev			54			96			129			184		
Max. load (GD2: N · m ² {kgf · m ² })	kg · m ²			0.125 (5 {0.5})			0.50 (20 {2})			0.75 (30 {3})			1.25 (50 {5})		1 (40 {4})
Index number	rev ¹			1	2	3	1	2	3	1	2	3	1	2	3
Max. revolution speed	min ⁻¹			200		150	200		150	150			100		
Required oil volume	L/min			13		10	22		17	22			21		
Index time	s ★3			0.50	0.35	0.30	0.70	0.50	0.40	0.80	0.60	0.50	1.00	0.70	0.60
Speed reduction signal emitting angle	120° on this side.			100° on this side.		120° on this side.		100° on this side.		120° on this side.		100° on this side.	90° on this side.		
Rated pressure	MPa {kgf/cm ² }			1st type : 3.5 {35}			2nd type : 5 {50}			3rd type : 7 {70}					
Permissible back pressure	MPa {kgf/cm ² }			1 {10}											
Rated flow rate	L/min			20											
Indexing accuracy	±0.1°														
loose angle	R groove: ±0.1°						V groove: 0°								
Radial load	kN {kgf}			2.25 {225}			4.5 {450}								
Thrust load	kN {kgf}			2.25 {225}			3.5 {350}								
Lowest operating pressure	MPa {kgf/cm ² }			1.5 {15}											
Holding torque	N · m {kgf · m}			160 {16}											

Note) ★3 The index time is the one at the pressure 3.5MPa {35kgf/cm²}.