

Small-size compact design pneu-
matic cylinders with guide useful for
space-saving design of equipment

- Small-size compact design pneumatic cylinders with guide having bores of 12 to 32 mm
- Selectable from 16 types of sensors according to the purpose of use
- Two sensor grooves are provided on each of front and rear sides of the cylinder body.
- Piping ports are on the front and side of the cylinder body. One of two piping directions can be selected.
- Since the cylinder body has through holes in the front, tapped holes in the bottom and two tapped holes differing in pitch width in the rear, it can be secured by various methods.



Cylinder Specifications

Model	10G-3
Type	Slide bearing/linear bush bearing
Cylinder bore (mm)	φ12·φ16·φ20·φ25·φ32
Working fluid	Air
Lubrication	Unnecessary
Working pressure range	0.1 to 1 MPa
Proof test pressure	1.5 MPa
Working speed range	50 to 500 mm/s
Working temperature range	+5 to +50℃
Structure of cushioning	With cushion pads (nitrile rubber) on both ends
Tolerance of stroke	φ12 to φ25: 0 to 1.5 mm, φ32: 0 to +2.0 mm
Piping connecting diameter	φ12·φ16: M5×0.8, φ20 to φ32: Rc1/8

Standard Stroke Range

Bore (mm)	Cylinder stroke (mm)											
	10	20	25	30	40	50	75	100	125	150	175	200
φ12	○	○	—	○	○	○	○	○	—	—	—	—
φ16	○	○	—	○	○	○	○	○	—	—	—	—
φ20	—	○	—	○	○	○	○	○	○	○	○	○
φ25	—	○	—	○	○	○	○	○	○	○	○	○
φ32	—	—	○	—	—	○	○	○	○	○	○	○

Product Lineup

Unit: mm

Series Variation		Type	φ12	φ16	φ20	φ25	φ32
Standard	Double acting type	Slide bearing 10G-3AM	●	●	●	●	●
		Linear bush bearing 10G-3AL	●	●	●	●	●

Theoretical Output Table

Unit: N

Bore mm	Pressure receiving area mm ²	Working pressure (MPa)						
		0.2	0.3	0.4	0.5	0.6	0.7	
φ12	Extension side	113	22.6	33.9	45.2	56.5	67.8	79.1
	Retraction side	84	16.8	25.2	33.6	42	50.4	58.8
φ16	Extension side	201	40.2	60.3	80.4	100.5	120.6	140.7
	Retraction side	150	30	45	60	75	90	105
φ20	Extension side	314	62.8	94.2	125.6	157	188.4	219.8
	Retraction side	235	47	70.5	94	117.5	141	164.5
φ25	Extension side	490	98	147	196	245	294	343
	Retraction side	377	75.4	113.1	150.8	188.5	226.2	263.9
φ32	Extension side	804	160.8	241.2	321.6	402	482.4	562.8
	Retraction side	603	120.6	180.9	241.2	301.5	361.8	422.1

Weight Table

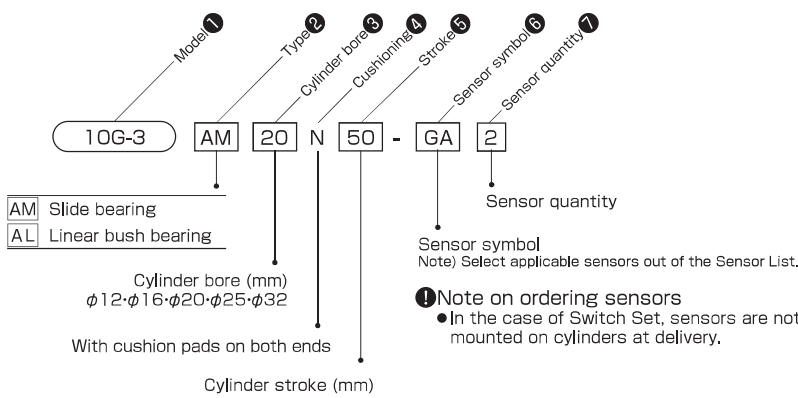
Unit: g

Type	Bore mm	Cylinder stroke (mm)												PD/PE sensor
		10	20	25	30	40	50	75	100	125	150	175	200	
Slide bearing	φ12	190	230	—	270	310	350	470	570	—	—	—	—	1:15 3:35
	φ16	270	330	—	380	440	490	660	800	—	—	—	—	
	φ20	—	540	—	630	710	800	1040	1250	1500	1710	1930	2140	
	φ25	—	780	—	900	1020	1140	1480	1780	2130	2420	2720	3010	
	φ32	—	—	1320	—	—	1750	2190	2620	3160	3590	4020	4450	
Linear bush bearing	φ12	180	220	—	260	320	350	450	540	—	—	—	—	
	φ16	270	320	—	370	470	520	650	780	—	—	—	—	
	φ20	—	550	—	630	800	880	1080	1280	1550	1750	1950	2150	
	φ25	—	790	—	900	1150	1260	1530	1800	2140	2410	2680	2950	
	φ32	—	—	1280	—	—	1670	2300	2690	3170	3550	3940	4330	

• "1" and "3" shown in the sensor additional weight column are cord lengths. (1: 1m 3: 3m)
[Calculation formula] Cylinder weight (g)=basic weight+(sensor weight×sensor quantity)
[Calculation example] 10G-3, slide bearing, bore φ20, cylinder stroke 50 mm, 2 pcs of PD11L1 (cord length 1 m)
800+ (15×2) =830g

● How to order

Standard



Standard Stroke Range

Bore mm	Cylinder stroke (mm)											
	10	20	25	30	40	50	75	100	125	150	175	200
φ12	○	○	—	○	○	○	○	○	—	—	—	—
φ16	○	○	—	○	○	○	○	○	—	—	—	—
φ20	—	○	—	○	○	○	○	○	○	○	○	○
φ25	—	○	—	○	○	○	○	○	○	○	○	○
φ32	—	—	○	—	—	○	○	○	○	○	○	○

Sensor List

Type	Sensor symbol	Load voltage range	Load current range	Protective circuit	Indicating lamp	Wiring method	Cord length	Applicable load		
Reed sensor	 PD12L1	24 V DC 110 V AC	DC: 2.5 to 40 mA AC: 2.5 to 20 mA	None	None	0.2 mm ² , 2-core, outer dia. φ2.6 mm, rear wiring	1 m	Small relay, programmable controller		
	 PD12L3					3 m				
	 PD11L1		DC: 5 to 40 mA AC: 5 to 20 mA		(LED Lights when sensing)	0.2 mm ² , 2-core, outer dia. φ2.6 mm, rear wiring	1 m			
	 PD11L3					3 m				
	 PD32L1		DC: 2.5 to 40 mA AC: 2.5 to 20 mA		None	0.2 mm ² , 2-core, outer dia. φ2.6 mm, upper wiring	1 m			
	 PD32L3					3 m				
	 PD31L1		DC: 5 to 40 mA AC: 5 to 20 mA		(LED Lights when sensing)	0.2 mm ² , 2-core, outer dia. φ2.6 mm, upper wiring	1 m			
	 PD31L3					3 m				
Solid state sensor	 PD14L1	10 to 28 V DC	5 to 20 mA	Provided	(LED Lights when sensing)	0.2 mm ² , 2-core, outer dia. φ2.6 mm, rear wiring	1 m	Small relay, programmable controller		
	 PD14L3	28 V DC or less	5 to 20 mA			0.15 mm ² , 3-core, outer dia. φ2.6 mm, rear wiring	3 m			
	 PD13L1					0.15 mm ² , 3-core, outer dia. φ2.6 mm, rear wiring	1 m			
	 PD13L3	10 to 28 V DC	0.1 to 40 mA			0.2 mm ² , 2-core, outer dia. φ2.6 mm, upper wiring	3 m			
	 PE34L1					0.2 mm ² , 2-core, outer dia. φ2.6 mm, upper wiring	1 m			
	 PE34L3	28 V DC or less	0.1 to 40 mA			0.15 mm ² , 3-core, outer dia. φ2.6 mm, upper wiring	3 m			
	 PE33L1					0.15 mm ² , 3-core, outer dia. φ2.6 mm, upper wiring	1 m			
	 PE33L3					0.15 mm ² , 3-core, outer dia. φ2.6 mm, upper wiring	3 m			

- Notes) ●For the sensors without a protective circuit, be sure to provide a protective circuit (SK-100) with the load when using any induction load (relay, etc.).
- For handling of sensors, be sure to see the sensor specifications at the end of this catalog.
- We recommend AND Unit (AU series) for multiple sensors connected in series.
- For details, refer to AND Unit at the end of this catalog.

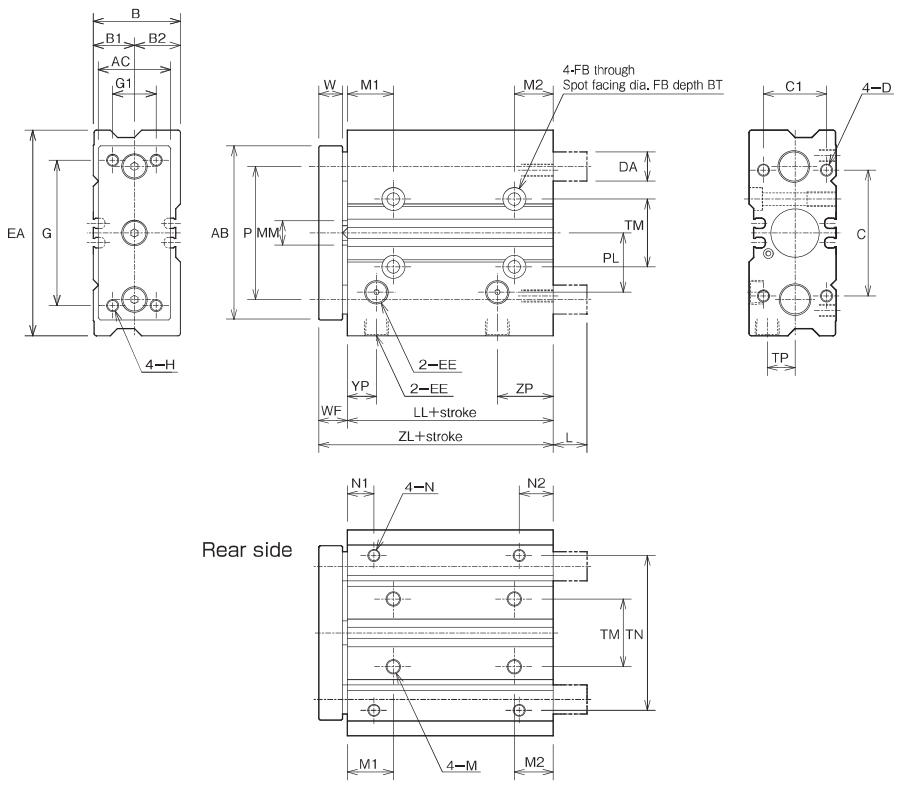
●PD/PE type sensor



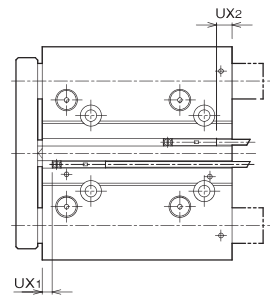
10G-3/TAG3 Bore is available. CAD/DATA is available.

AM (Slide bearing)

AL (Linear bush bearing)



Switch Set



Dimensional Table

Symbol Bore	AB	AC	B	B1	B2	BT	C	C1	D	DA		EA	EE	FB	FG	G	G1	H
										Slide bearing	Linear bush bearing							
φ12	56	22	26	13	13	4.5	40	18	M4×0.7 Depth 9	8	6	58	M5×0.8	φ4.3	φ8	48	14	M4×0.7
φ16	62	25	30	15	15	4.5	42	22	M5×0.8 Depth 11	10	8	64	M5×0.8	φ4.3	φ8	52	16	M5×0.8
φ20	72	30	36	17	19	5.5	52	26	M5×0.8 Depth 13	12	10	85	Rc1/8	φ5.2	φ9.5	60	18	M5×0.8
φ25	86	38	42	21	21	5.5	62	32	M6×1 Depth 15	16	13	96	Rc1/8	φ5.2	φ9.5	70	26	M6×1.0
φ32	112	48	51	26	25	6.5	80	38	M8×1.25 Depth 18	20	16	116	Rc1/8	φ6.8	φ11	96	30	M8×1.25

Symbol Stroke	L																			
	Slide bearing										Linear bush bearing									
	10	20	25	30	40	50	75	100	125	150	175	200	10	20	25	30	40	50	75	100
φ12	0	0	—	0	0	0	18	18	—	—	—	—	0	0	—	0	14	14	14	14
φ16	0	0	—	0	0	0	21	21	—	—	—	—	0	0	—	0	21	21	21	21
φ20	—	0	—	0	0	0	14	14	31	31	31	31	—	0	—	0	27	27	27	27
φ25	—	0	—	0	0	0	14	14	31	31	31	31	—	2	—	2	35	35	35	35
φ32	—	—	20	—	—	20	20	20	42	42	42	42	—	—	8	—	8	42	42	55

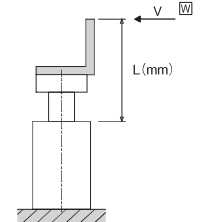
Symbol Bore	LL	M	M1	M2	MM	N	N1	N2	P	PL	TM	TN	TP	W	WF	YP	ZL	ZP
φ12	29	M5×0.8 Depth 10	5	20	φ6	M4×0.7 Depth 7	12	12	41.5	19.5	23	50	8.5	8	10	11	39	15
φ16	31	M5×0.8 Depth 10	5	22	φ8	M5×0.8 Depth 7	11	13	46	23	24	54	10	10	12	11	43	17
φ20	35	M6×1 Depth 12	19	16	φ10	M5×0.8 Depth 7	11	14	55	24.5	28	64	11.5	10	12	12	47	23
φ25	35.5	M6×1 Depth 12	22	12.5	φ12	M6×1 Depth 9	12	13.5	65	24	34	76	13.5	10	12	11	47.5	23.5
φ32	33.5	M8×1.25 Depth 16	22	14.5	φ16	M8×1.25 Depth 11	12	16.5	80	31	42	100	16	12	14	11.5	47.5	25

Dimensional Table

Symbol Bore	Reed sensor		Solid state sensor			
	UX1	UX2	PD1 * L *		PE3 * L *	
			UX1	UX2	UX1	UX2
φ12	0	6	5	0	4	10
φ16	3	4	9	0	8	8
φ20	5	6	11	0	10	10
φ25	4.5	7	10.5	1	9.5	11
φ32	2.5	7	8.5	1	7.5	11

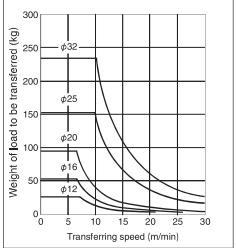
Note) Dimension UX indicates the optimum sensor mounting position for detection of stroke end.

Allowable capacity when used as stopper



- ①The "Allowable Stopper Capacity" chart shows the capacities of 10G-3AM with bores of 12 to 25 mm above a link bar of stroke of 30 mm and that with a bore of 32 mm above a link bar of stroke of 25 mm.
- ②When a plate is fitted to the link bar or when the cylinder is used with a stroke more than the above value, convert the capacity as stated in the following table.
- ③To ascertain whether or not the cylinder can be lowered when it stops a load to be transferred, see the "Working Traverse Loading" chart.
- ④The linear bush bearing type cylinders cannot be used as stoppers.

Allowable Stopper Capacity



Note) Capacity chart of 10G-3AM with bores of 12 to 25 mm above link bar of stroke of 30 mm and that with a bore of 32 mm above link bar of stroke of 25 mm

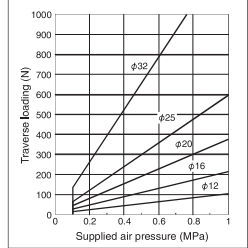
$W(kg) = \text{Weight of load to be transferred} \times \frac{L}{k}$

Conversion Coefficient Table (k: coefficient)

Cylinder bore (mm)	φ12	φ16	φ20	φ25	φ32
k	40	42	42	42	44

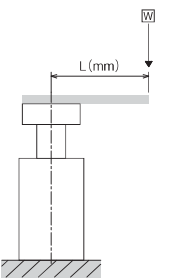
- Notes) ● The weight of load to be transferred is the value obtained from the "Allowable Stopper Capacity" chart shown left.
- Dimension L is the distance from the cylinder body upper surface to the plate front edge in the state where the cylinder has risen.

Working Traverse Loading



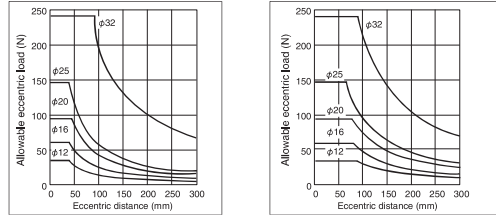
Note) The working traverse loading values are theoretical values. Select a type based on the value corresponding to 70% of the value shown in the above chart.

Allowable eccentric load when used as lifter



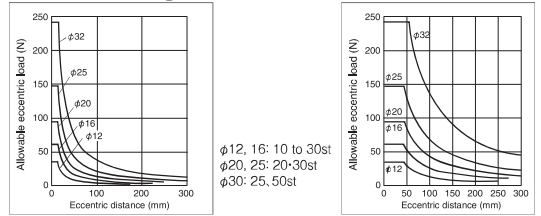
The following charts indicate dynamic allowable values of eccentricity of L (mm) from the guide rod center.
If the eccentric loading direction turns 90° from the direction shown left (Fig. 1), the allowable value is 50% of the value shown in the following chart.

Allowable Eccentric Load
Slide bearing (10G-3AM)



φ12, 16: 10 to 50st
φ20, 25: 20 to 50st
φ32: 25-50st

Linear bush bearing (10G-3AL)

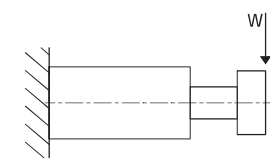


φ12, 16: 10 to 30st
φ20, 25: 20-30st
φ30: 25, 50st

φ12, 16: 40 to 100st
φ20, 25: 40-200st
φ30: 75 to 200st

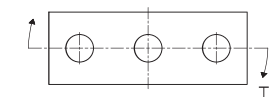
(Fig. 1)

Allowable traverse loading



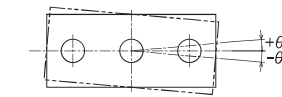
Dynamic allowable value to move the cylinder with traverse loading W (load perpendicular to the guide rod) applied to the guide rod end

Allowable rotating torque



Dynamic allowable torque value to move the cylinder with rotating torque T applied to the guide rod end

Non-rotation accuracy



Value indicating backlash owing to clearance between guide rod and bearing as deflection angle from piston rod

Unit: N

Bore mm	Type of bearing	Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200		
φ12	Slide bearing	24	19	—	16	14	12	37	31	—	—	—	—		
	Linear bush bearing	20	15	—	12	33	29	19	16	—	—	—	—		
φ16	Slide bearing	40	33	—	28	24	21	55	46	—	—	—	—		
	Linear bush bearing	33	26	—	21	50	44	34	28	—	—	—	—		
φ20	Slide bearing	—	52	—	45	39	35	55	46	75	67	60	55		
	Linear bush bearing	—	41	—	34	77	69	54	45	51	43	38	34		
φ25	Slide bearing	—	69	—	60	52	47	73	62	100	89	80	73		
	Linear bush bearing	—	61	—	51	115	104	82	68	69	61	54	49		
φ32	Slide bearing	—	—	168	—	—	131	107	91	140	125	113	103		
	Linear bush bearing	—	—	90	—	—	64	162	135	109	96	86	77		

Unit: N · m

Bore mm	Type of bearing	Stroke (mm)													
		10	20	25	30	40	50	75	100	125	150	175	200		
φ12	Slide bearing	0.5	0.4	—	0.33	0.28	0.25	0.77	0.65	—	—	—	—		
	Linear bush bearing	0.41	0.31	—	0.25	0.69	0.59	0.4	0.32	—	—	—	—		
φ16	Slide bearing	0.91	0.75	—	0.64	0.56	0.49	1.25	1.06	—	—	—	—		
	Linear bush bearing	0.76	0.6	—	0.49	1.14	1.02	0.79	0.65	—	—	—	—		
φ20	Slide bearing	—	1.43	—	1.23	1.08	0.96	1.51	1.27	2.06	1.84	1.65	1.5		
	Linear bush bearing	—	1.12	—	0.93	2.12	1.9	1.5	1.24	1.42	1.17	1.04	0.94		
φ25	Slide bearing	—	2.26	—	1.94	1.71	1.52	2.38	2	3.25	2.89	2.61	2.37		
	Linear bush bearing	—	1.98	—	1.65	3.75	3.37	2.68	2.22	2.24	1.97	1.76	1.58		
φ32	Slide bearing	—	—	6.71	—	—	5.24	4.3	3.64	5.6	5.01	4.52	4.12		
	Linear bush bearing	—	—	3.61	—	—	2.55	6.48	5.41	4.36	3.84	3.43	3.1		

Bore mm	Type of bearing	Non-rotation accuracy θ
φ12	Slide bearing	±0.12°
	Linear bush bearing	±0.06°
φ16	Slide bearing	±0.10°
	Linear bush bearing	±0.06°
φ20	Slide bearing	±0.09°
	Linear bush bearing	±0.05°
φ25	Slide bearing	±0.08°
	Linear bush bearing	±0.05°
φ32	Slide bearing	±0.06°
	Linear bush bearing	±0.04°