

Work loading and cylinder stroking total sensing system in low-load range

- Increased variety of "ATSUKAN" Series in low-load range (1.0 kN and 2.5 kN)
- Addition of analog output terminals for stroke and load values enables data evaluation during measurement.
- Applicable to low-pressure hydraulic cylinder 1OH-6
- Types provided with only load sensor or stroke sensor are available.



Actuator specifications

Function	PQC-AA		PQCL-AA		PQCP-AA
Type	Press-fit sensing cylinder		Load sensing cylinder		Position sensing cylinder
Built-in sensor	Stroke sensor and load sensor		Load sensor		Stroke sensor
Series variation	Double acting single rod				
Cylinder bore (mm)	φ50	φ80	φ50	φ80	φ40, φ50, φ63, φ80, φ100, φ125
Rated load (kN)	1.0kN (at 0.5 MPa)	2.5kN (at 0.5 MPa)	1.0kN (at 0.5 MPa)	2.5kN (at 0.5 MPa)	—
Working fluid	Air				
Lubrication	Unnecessary (but possible)				
Working pressure range	0.05 to 1 MPa				
Proof test pressure	1.5 MPa				
Stroke (mm)	50, 100, 150, 200, 250, 300, 350, 400, 450, 500				
Working temperature range	-10 to +70°C (No freezing)				
Max. press-fitting speed	Interval at which measurement is possible at 100 mm/s (mm) Length measuring interval at 100 mm/s: Every 0.10 mm Length measuring interval at 20 mm/s: Every 0.02mm		—		—
Mounting style	FG		FG		SD · LA · LB · FA · TC
Applicable controller	PQC-CU-02-VAB000-A		PQCL-CU2-A · PQCL-CU2-B		PQCPA Note) Sensor output: 0 to 10 V

Sensor specifications

Item	Stroke sensor	Load sensor
Resolution	30μm or less	1N
Repeatability	Within ± 0.01%FS	0.2%
Non-linearity	±0.025%FS	0.5%FS
Sensor type	Absolute method	Load cell type
Analog voltage output	0 to 10 V	Max. ± 10 V

Note) Internal processing is performed at 1 N, and judgement is performed at 10 N.

Control unit specifications

Item	Specifications
Power supply	100 V AC±10% 50/60Hz
Power supply capacity	30VA (W)
Ambient temperature	0 to 45°C (No freezing)
Ambient humidity	85% or less (No condensing)
Insulation resistance	1000 V DC 100MQ
Weight	3kg
Indicator	16 characters × 4 digits LCD with backlight
Control input	24 V DC (16 mA/point) incorporated Photo-coupler isolation
Control output	Photo-coupler open collector output (Max. 10 mA/point at 24 V DC)
Number of program channels	Up to 15 channels
Min. display unit	Length measurement: 10μm Load: 10N

External input/output

Pin signal	Signal name	Pin signal	Signal name
1	Input channel 0	13	Output channel 3
2	Input channel 1	14	Signal of position before start of press-fit
3	Input channel 2	15	Signal of press-fit completion position
4	Input channel 3	16	OK signal
5	START	17	LOW NG signal
6	RESET	18	HIGH NG signal
7	ZERO set (stroke)	19	MAX NG signal
8	Input AUX 0	20	SYS NG signal
9	Input COM	21	READY signal
10	Output channel 0	22	Press-fit end NG signal
11	Output channel 1	23	Output AUX 0
12	Output channel 2	24	Output COM

Data processing software operating environment

OS	Windows2000, XP (English version)
Memory	32 MB or more
Disk drive	Free space of 5 MB or more is necessary.

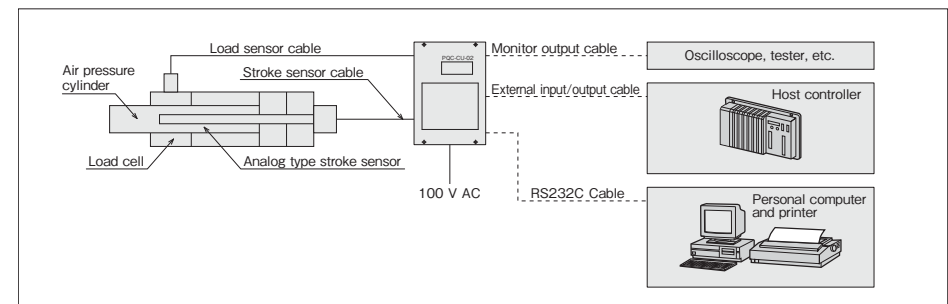
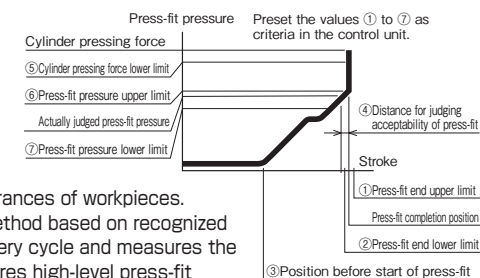
Note) Windows is a registered trade mark of Microsoft Corporation, Inc., USA.

Procedures for judging by "ATSUKAN"

Conventional press-fit judgment works by switching between high and low hydraulic pressures and measuring peak values before press-fit end and must exclude the area near the press-fit end from the judgment range because of difference in responsibility among control devices, scanning timing of programmable control unit and press-fit end variation owing to accumulated fabrication tolerances of workpieces. The system with the newly developed "judgment method based on recognized press-fit end" which recognizes the press-fit end every cycle and measures the press-fit pressure just before the press-fit end ensures high-level press-fit quality control.

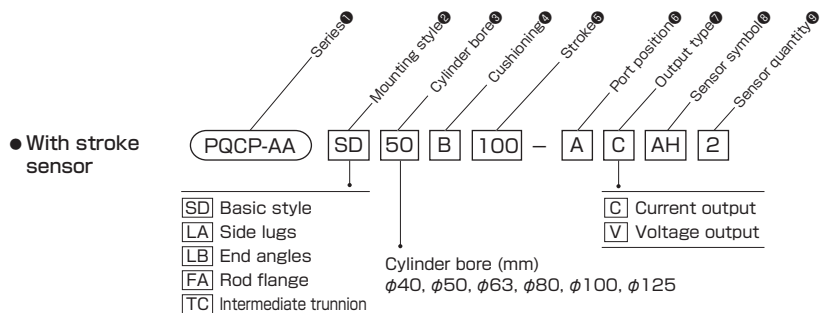
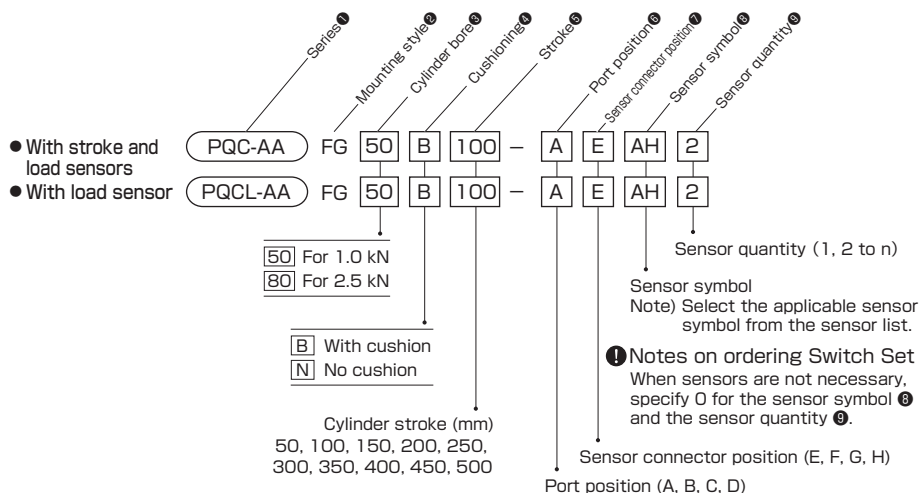
In addition, the system measures the position of the recognized press-fit end and the final pressing force, which prevents inclusion of foreign particles and mounting of improper model and detects troubles in the thrust force system.

*For the details of measuring procedures, see the procedures for measuring by "ATSUKAN" stated in "ATSUKAN/PQC Series."

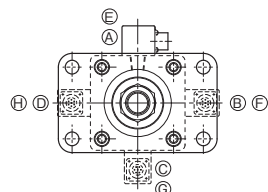
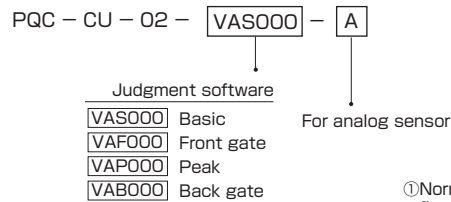


How to order

Cylinder body If no attachment is necessary, the box enclosed with dashed line must be blank.



Control unit type



- Normally, the load sensor connector connecting port is fitted toward the cylinder rear end. However, if the connecting port position overlaps with the port position (A or C), the connecting port will be located at a position turned 90°clockwise. When the ports B and D are provided, the connector port cannot be located on the same surface.
- When requiring a cylinder having a non-standard stroke, contact us.
- One rod end lock nut is supplied.

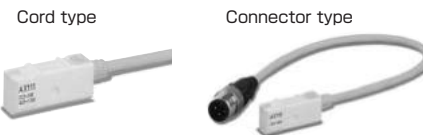
Sensor list

Type	Sensor symbol	Load voltage range	Load current range	Max. switching capacity	Protective circuit	Indicating lamp	Wiring method	Cord length	Applicable load
Reed sensor	AH AX111CE	DC:5 to 30V	DC:5 to 40mA	DC:1.5W AC:2VA	Provided	LED (lights in red when sensing)	0.3 mm ² , 2-core, external diameter φ4 Rear wiring	1.5m	Small relay programmable controller
	AJ AX115CE	AC:5 to 120V	AC:5 to 20mA		None			5m	
	AE AX125CE	DC: 30 V or less AC: 120 V or less	DC: 40 mA or less AC: 20 mA or less	2VA	Provided	LED (lights in red when sensing)	4-pin connector type Rear wiring	5m	
	AK AX11ACE	AC:5 to 120V	5 to 20mA					0.5m	
	AL AX11BCE	DC:5 to 30V	5 to 40mA					1.5W	
Solid state sensor	BE AX201CE-1	DC:5 to 30V	5 to 40mA	—	Provided	LED (lights in red when sensing) LED (two-LED type, red and green)	0.3 mm ² , 2-core, external diameter φ4 Rear wiring	1.5m	Small relay programmable controller
	BF AX205CE-1							5m	
	CE AX211CE-1							1.5m	
	CF AX215CE-1							5m	
	CT AX211CE-1							1.5m	
	CU AX215CE-1							5m	
	CV AX21BCE-1							0.5m	
	CW AZ211CE-1							1.5m	
	CX AZ215CE-1							5m	
	CY AZ21BCE-1							0.5m	

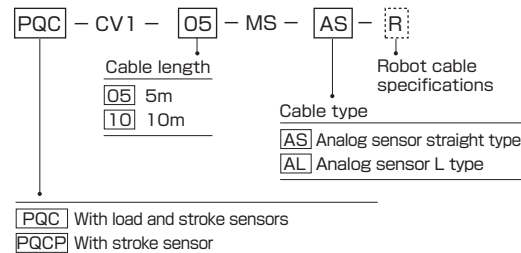
- Notes)
- When any induction load (relay or the like) is used for a sensor without a protective circuit, fit a protective circuit (SK-100) to the load without fail.
 - For handling of the sensors, read the sensor specifications at the end of this book.

Standard type

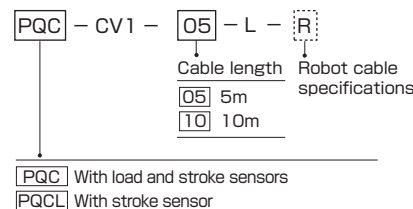
AX type sensor



Stroke sensor cable type



Load sensor cable type



Power cable type

PQC - CV1 - 02 - P
(100 V AC, with ground wire, cord length 2m)

Data processing software type

PQC - SF1 - V *

Personal computer connecting cable type

PQC - CV1 - 03 - C

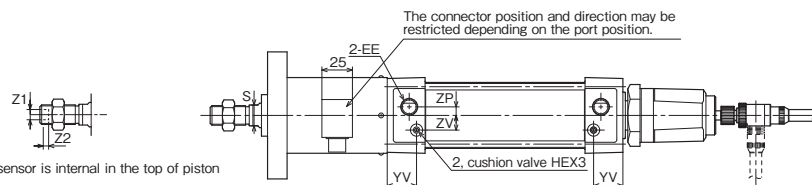
Storage box type

PQC - BX - 01

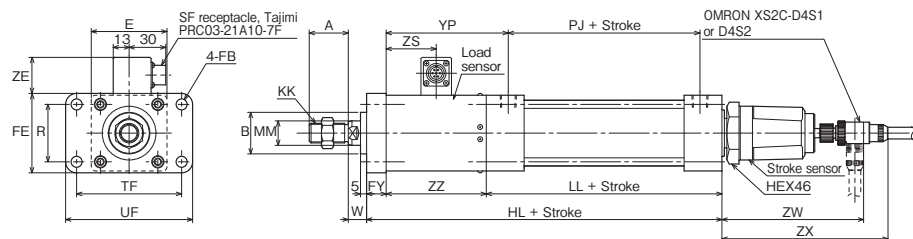
Cylinder unit/Press-fit control system

PQC-AA FG □ Bore □ Cushioning □ Stroke □ Port position □ Sensor connector position □ Sensor symbol □ Sensor quantity

Load	Bore	Z1	Z2
1.0kN	φ50	φ11	5
2.5kN	φ80		

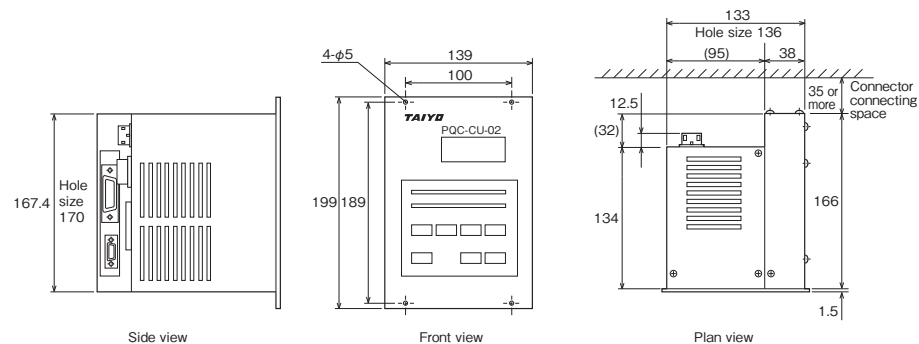


The stroke sensor is internal in the top of piston rod.
When using a spring pin, fit the pin in the range of Z2 from the end face.



Control unit

PQC-CU-02- □ Judgment software -A



Dimensional table : Press-fit control system cylinders

Symbol		A	B	E	EE	FB	FE	FY	HL	KK	LL	MM	PJ	R
Load	Bore													
1.0kN	φ50	32	φ34	□62	Rc1/4	φ9	65	16	191	M16×1.5	93	φ20	57	47
2.5kN	φ80	40	φ39	□94	Rc3/8	φ12	95	20	218	M20×1.5	108	φ25	68	70

Symbol		S	TF	UF	W	YP	YV	ZE	ZS	ZP	ZV	ZW	ZX	ZZ
Load	Bore											L type	Straight type	
1.0kN	φ50	17	86	104	15	100	24	29.5	41	7	12	116	136	82
2.5kN	φ80	21	119	143	24	110	29	30.4	45	11	16	116	136	90

CAUTION

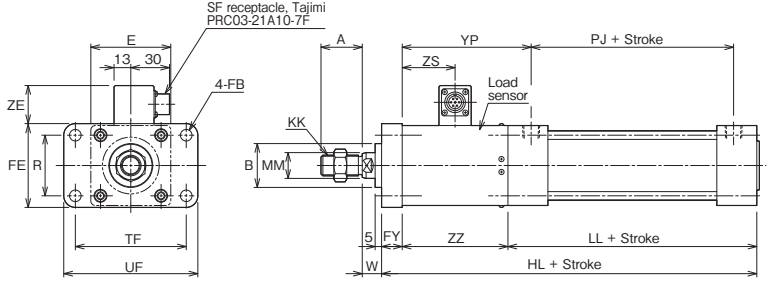
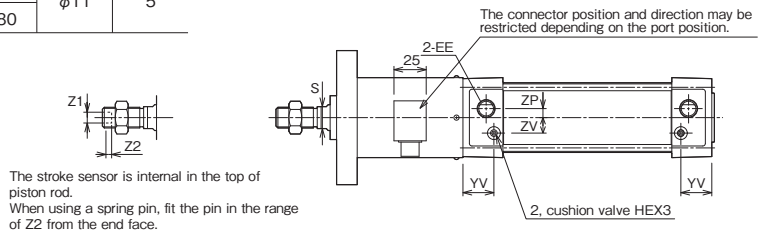
Cautions for use

- ① Avoid connecting fixed piping to the cylinder unit. Use flexible hoses.
- ② As a rule, use the cylinder perpendicularly to the ground. If the cylinder is used in another direction, please contact us.
- ③ If the cylinder unit must be disassembled for maintenance, please contact us.
- ④ The stroke sensor is internal in the top of piston rod. When using a spring pin or the like, fit it within the range shown in the above dimensional table.
- ⑤ The press-fit sensing system does not have a positioning function.

Cylinder unit/Load sensing cylinders

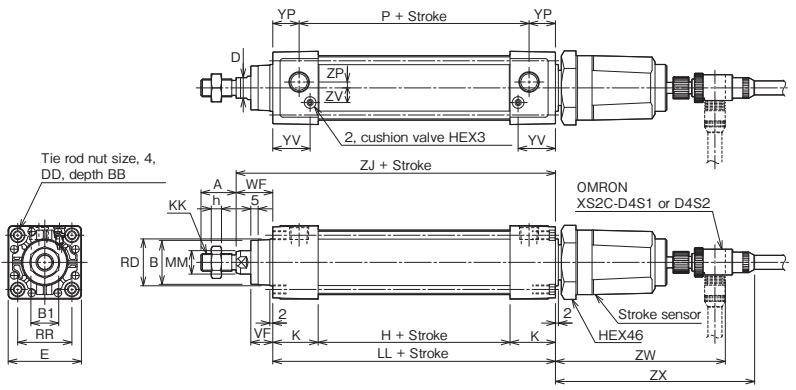
PQCL-AA FG Bore Cushioning Stroke Port position Sensor connector position Sensor symbol Sensor quantity

Load	Bore	Z1	Z2
1.0kN	φ50	φ11	5
2.5kN	φ80		



Cylinder unit/Position sensing cylinders

PQCP-AA SD Bore Cushion type Stroke Port position Output type Sensor symbol Sensor quantity



● Mounting style: SD, LA, BL, FA or TC
● For the details, contact us.

Dimensional table : Load sensing

Load	Bore	Symbol												
		A	B	E	EE	FB	FE	FY	HL	KK	LL	MM	PJ	R
1.0kN	φ50	32	φ34	□62	Rc1/4	φ9	65	16	191	M16×1.5	93	φ20	57	47
2.5kN	φ80	40	φ39	□94	Rc3/8	φ12	95	20	218	M20×1.5	108	φ25	68	70

Load	Bore	Symbol										
		S	TF	UF	W	YP	YV	ZE	ZP	ZS	ZV	ZZ
1.0kN	φ50	17	86	104	15	100	24	29.5	7	41	12	82
2.5kN	φ80	21	119	143	24	110	29	30.4	11	45	16	90

Dimensional table : Position sensing

Bore	Symbol																	
	A	B	B1	BB	D	DD	E	EE	H	h	K	KK	LL	MM	P	RR	VF	WF
φ40	24	φ30	19	14	14	M6×1	□50	Rc1/4	31	7	31	M12×1.25	93	φ16	57	□37	15	25
φ50	32	φ34	22	14	17	M6×1	□62	Rc1/4	31	10	31	M16×1.5	93	φ20	57	□47	15	25
φ63	32	φ34	22	14	17	M8×1.25	□75	Rc3/8	32	10	32	M16×1.5	96	φ20	60	□56	15	25
φ80	40	φ39	27	15	21	M10×1.5	□94	Rc3/8	36	12	36	M20×1.5	108	φ25	68	□70	21	35
φ100	40	φ46	27	15	26	M10×1.5	□112	Rc1/2	36	12	36	M20×1.5	108	φ30	68	□84	21	35
φ125	54	φ55	36	15	32	M12×1.75	□136	Rc1/2	42	16	36	M27×2	114	φ35	74	□104	21	35

Bore	Symbol						
	YP	YV	ZJ	ZP	ZV	ZW	ZX
φ40	18	25.5	118	4	10	116	136
φ50	18	2	118	7	12	116	136
φ63	18	25	212	8	12	116	136
φ80	20	29	143	11	16	116	136
φ100	20	29	143	12	18	116	136
φ125	20	29	149	14	20	116	136