OMRON

INDUSTRIAL ROBOTS

SCARA robots for industrial applications
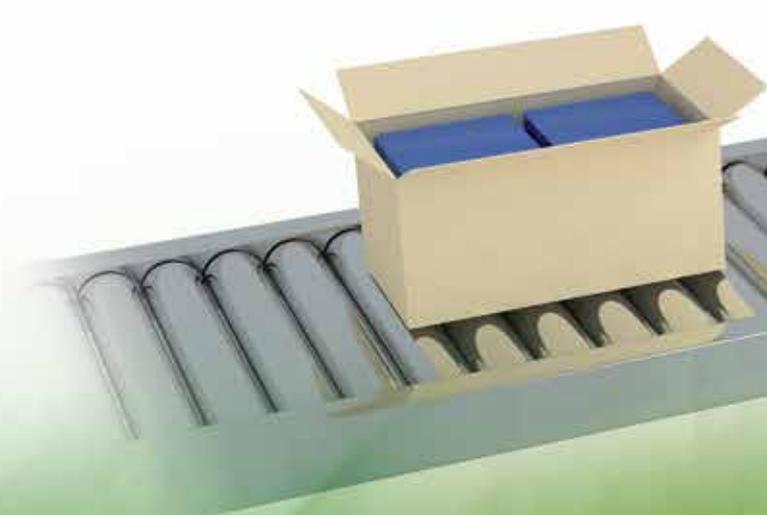
» Reliable and versatile

» Simple programming and quick set-up

» Pick & Place

reali**zing**

The wide reach and payload ranges allow you to choose the right robot type for your application. Special versions, such as clean-room and dust/ drip-proof types enable installation in critical environments for applications in food and pharmaceutical industries.

High reliability is ensured by the simple mechanical structure of our SCARA robots that use a belt-less system in the XG series via a direct coupling between motors, gearboxes, arms and the shafts.

XGL Series

- Open shaft for better wiring for gripper
- Tool flange for simple installation

High reliability

- Belt-less system
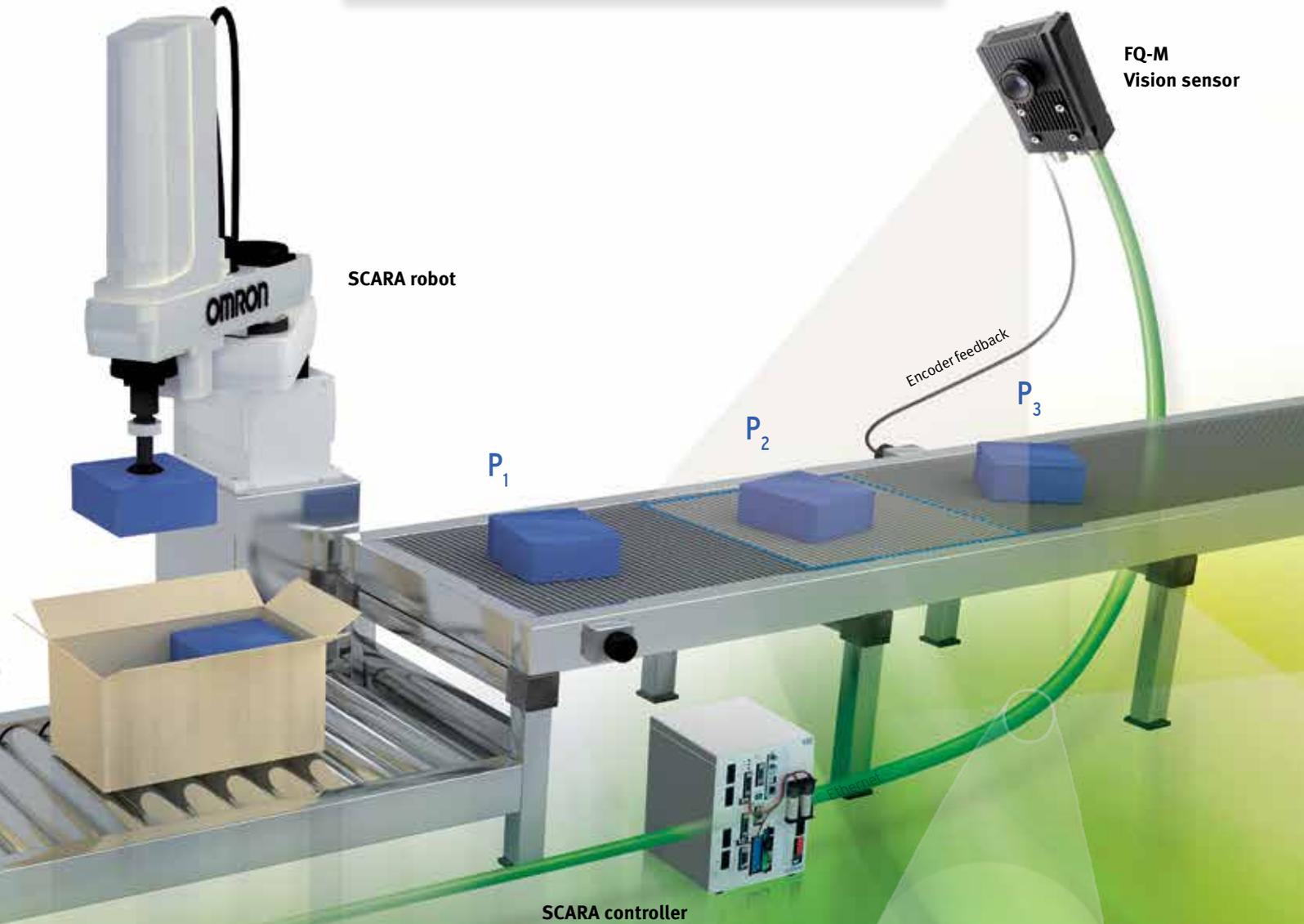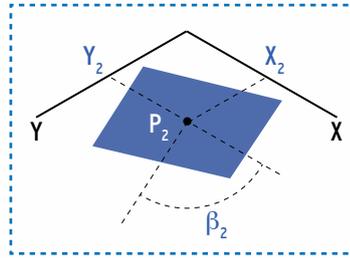- Direct coupling
- Maintenance-free

Benefits

- Higher reliability of SCARA robots (belt-less transmission on XG series, no electronic parts in movement)
- Higher precision and high speed
- Higher rigidity
- Easy integration of the FQ-M vision system

Object detection

The vision sensor calculates the coordinates of the pieces and sends the data to the robot controller via Ethernet.

Y_2 X_2

Y P_2 X

β_2

**FQ-M
Vision sensor**

SCARA robot

Encoder feedback

P_1 P_2 P_3

Ethernet

SCARA controller

$P_1 (x_1 y_1 \beta_1)$ $P_2 (x_2 y_2 \beta_2)$ $P_3 (x_3 y_3 \beta_3)$

Flexible Data Format

The FQ-M vision sensor provides a customisable data output format simplifying the programming manner of the robot controller.
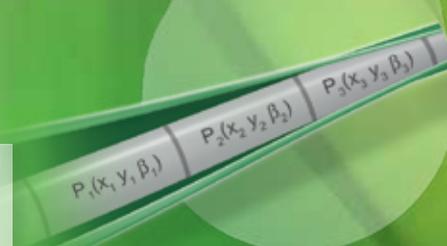
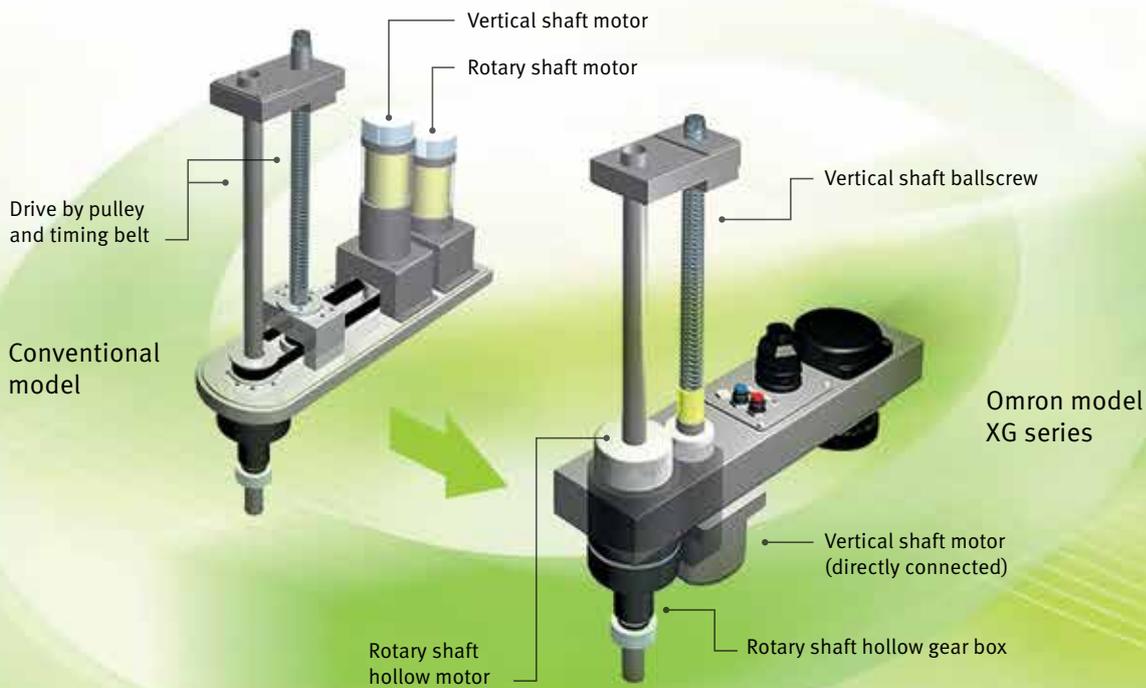The standard XG series implements a very reliable technology thanks to the simplicity of the mechanical system used for all axes. Completely without belts! The motion transmission is simply realized by direct coupling between motors and gearboxes (ballscrew for vertical axis) that ensures high accuracy and reduces the required maintenance.

Vertical shaft motor

Rotary shaft motor

Vertical shaft ballscrew

Drive by pulley
and timing belt

Conventional
model

Omron model
XG series

Vertical shaft motor
(directly connected)

Rotary shaft
hollow motor

Rotary shaft hollow gear box

Simulation software – ScaraSim

Using the simulation software it's possible to select the right robot type for your application. The motion planning calculation uses the same algorithm implemented in the robot controller in order to ensure the most reliable estimations.
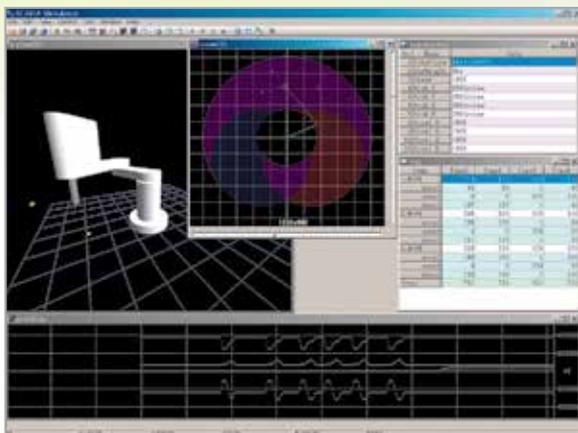
Easy programming plus integration

Program Library:
- Standard programs for pick & place application
  with tracking and vision system
- Palletizing
- Sealing

Function Blocks available for communicating with:
- Vision systems (Xpectia,ZFX)
- CJ PLC series (DeviceNet, Ethernet, RS232, etc)
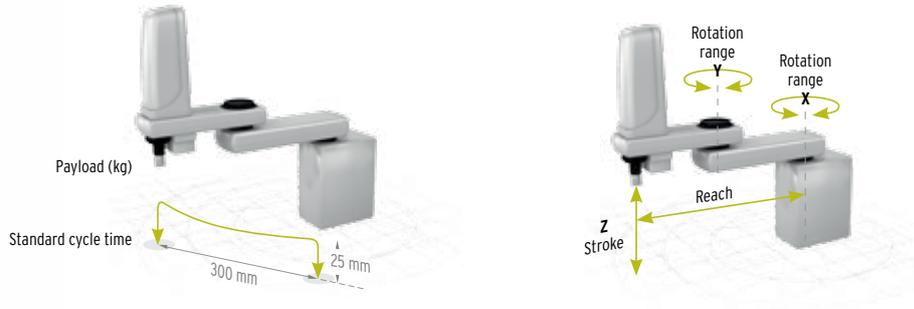
Wide range providing the performance you r

The wide reach and payload ranges from 120 mm to 1200 mm and from 1 kg to 50 kg, allowing for precise adjustment of the robot to your application. Special versions, such as clean-room and dust/drip-proof types enable installation in critical environments for applications in the food and pharmaceutical industries. For special customization please contact your Omron representative. For further technical details please refer to the robot datasheet

STANDARD MODELS R6Y[]			XG series - Tiny type				XGL series - Low payload				
			XG120	XG150	XG180	XG220	XGL250	XGL350	XGL400	XGL500	XGL600
Max. payload (kg)			1	1	1	1	5 (4)*1	5 (4)*1	5 (4)*1	5 (4)*1	5 (4)*1
Reach (mm)			120	150	180	220	250	350	400	500	600
Repeatability (mm)*2	X, Y	±(mm)	0.005	0.005	0.005	0.01	0.01	0.01	0.01	0.01	0.01
	Z	±(mm)	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
	R	±(º)	0.004	0.004	0.004	0.01	0.004	0.004	0.004	0.004	0.004
Axis specifications	X	Arm length (mm)	45	75	105	111	100	200	250	250	350
	X	Rotation range ±(º)	125	125	125	120	140	140	140	140	140
	Y	Arm length (mm)	75	75	75	109	150	150	150	250	250
	Y	Rotation range ±(º)	145	145	145	140	144	144	144	144	144
	Z	Stroke (mm)	50	50	50	100	150	150	150	150	150
	R	Rotation range ±(º)	360	360	360	360	360	360	360	360	360
Maximum speed	X, Y	Combined (mm/s)	3300	3400	3300	3400	4500	5600	6100	5100	4900
	Z	(mm/s)	900	900	900	700	1100	1100	1100	1100	1100
	R	(º/s)	1700	1700	1700	1700	1020	1020	1020	1020	1020
Standard time cycle (sec)			0,33*3	0,33*3	0,33*3	0,46*3	0,49*4	0,49*4	0,49*4	0,59*4	0,63*4
Weight (kg)			6	6.1	6.2	7	14.5	15	15.5	17	18
Option	Tool flange R6YAC[]		-	-	-	-	XGLF	XGLF	XGLF	XGLF	XGLF
	Open shaft R6YAC[]		-	-	-	-	XGLS	XGLS	XGLS	XGLS	XGLS
Regeneration unit			N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.

SPECIAL MODELS R6Y[]			XGS series (W=Wall mount type / U=Inverse mount type)								XGLP250	XGLP350	XGLP400	XGLP500	XGLP600
			XGS300 (W/U)	XGS400 (W/U)	XGS500 (W/U)	XGS600 (W/U)	XGS700 (W/U)	XGS800 (W/U)	XGS900 (W/U)	XGS1000 (W/U)					
Max. payload (kg)			5 (4)*1	5 (4)*1	10	10	20	20	20	20	4	4	4	4	4
Reach (mm)			300	400	500	600	700	800	900	1000	250	350	400	500	600
Repeatability (mm)*2	X, Y	±(mm)	0,01	0,01	0.01	0.01	0.02	0.02	0.02	0.02	0,01	0,01	0,01	0,01	0,01
	Z	±(mm)	0,01	0,01	0.01	0.01	0.01	0.01	0.01	0.01	0,01	0,01	0,01	0,01	0,01
	R	±(º)	0,004	0,004	0.004	0.004	0.004	0.004	0.004	0.004	0,004	0,004	0,004	0,004	0,004
Axis specifications	X	Arm length (mm)	150	250	200	300	300	400	500	600	100	200	250	250	350
	X	Rotation range ±(º)	120	125	105	130	130	130	130	130	129	129	129	129	129
	Y	Arm length (mm)	150	150	300	300	400	400	400	400	150	150	150	250	250
	Y	Rotation range ±(º)	130	144	125	145	130	145	150	150	134	134	144	144	144
	Z	Stroke (mm)	150	150	200 (300)	200 (300)	200 (400)	200 (400)	200 (400)	200 (400)	150	150	150	150	150
	R	Rotation range ±(º)	360	360	360	360	360	360	360	360	360	360	360	360	360
Maximum speed	X, Y	Combined (mm/s)	4400	6100	7600	8400	8400	9200	9900	10600	4500	5600	6100	5100	4900
	Z	(mm/s)	1000	1100	2300 (1700)	2300 (1700)	2300 (1700)	2300 (1700)	2300 (1700)	2300 (1700)	1100	1100	1100	1100	1100
	R	(º/s)	1020 / 720	1020 / 720	1700 / 800	1700 / 800	920 / 480	920 / 480	920 / 480	920 / 480	1020	1020	1020	1020	1020
Standard time cycle (sec)			0,49*4	0,49*4	0,45*4	0,46*4	0,42*4	0,48*4	0,49*4	0,49*4	0,57*4	0,57*4	0,57*4	0,74*4	0,74*4
Weight (kg)			15.5	16	26	27	51	53	55	57	17.5	18	18.5	21	22
User wiring (sq x wires) / User tubing (Ø)			0.2 sq x 10 wires; Ø 4 x 3	0.2 sq x 10 wires; Ø 4 x 3	0.2 sq x 20 wires; Ø 6 x 3	0.2 sq x 20 wires; Ø 6 x 3	0.2 sq x 20 wires; Ø 6 x 3	0.2 sq x 20 wires; Ø 6 x 3	0.2 sq x 20 wires; Ø 6 x 3	0.2 sq x 20 wires; Ø 6 x 3	0.2 sq x 10 wires; Ø 4 x 4	0.2 sq x 10 wires; Ø 4 x 4	0.2 sq x 10 wires; Ø 4 x 4	0.2 sq x 10 wires; Ø 4 x 4	0.2 sq x 10 wires; Ø 4 x 4
Option	Tool flange R6YAC[]		XGLF	XGLF	-	-	-	-	-	-	XGLF	XGLF	XGLF	XGLF	XGLF
	Open shaft R6YAC[]		XGLS	XGLS	-	-	-	-	-	-	-	-	-	-	-
Regeneration unit			N.A.	N.A.	RGU3	RGU3	RGU3	RGU3	RGU3	RGU3	N.A.	N.A.	N.A.	N.A.	N.A.

*1 Maximum payload is 4kg when tool flange and hollow shaft options are installed.   *2 This is the value at constant ambient temperature.   *3 With 0.1 kg payload. When reciprocating 100mm in horizontal and 25mm in vertical directions.   *4 With 2 kg payload. When reciprocating 300mm in horizontal and 25mm in vertical directions.

need...

Payload (kg)

Standard cycle time

300 mm

25 mm

Rotation range Y

Rotation range X

Reach

Z Stroke

XG series / X series

	XG500	XG600	XGH600	XG700	XG800	XG900	XG1000	XX1200
	10	10	20	20	20	20	20	50
	500	600	600	700	800	900	1000	1200
	0.01	0.01	0.02	0.02	0.02	0.02	0.02	0.05
	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
	0.004	0.004	0.004	0.004	0.004	0.004	0.004	0.005
	200	300	200	300	400	500	600	600
	130	130	130	130	130	130	130	125
	300	300	400	400	400	400	400	600
	145	145	150	150	150	150	150	150
	200 (300)	200 (300)	200 (400)	200 (400)	200 (400)	200 (400)	200 (400)	400
	360	360	360	360	360	360	360	360
	7600	8400	7700	8400	9200	9900	10600	7400
	2300 (1700)	2300 (1700)	2300 (1700)	2300 (1700)	2300 (1700)	2300 (1700)	2300 (1700)	750
	1700	1700	1020	1020	1020	1020	1020	600
	0,45*4	0,46*4	0,47*4	0,42*4	0,48*4	0,49*4	0,49*4	0,91*4
	30	31	48 (50)	50 (52)	52 (54)	54 (56)	56 (58)	124
	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-
	RGU3	RGU3	RGU3	RGU3	RGU3	RGU3	RGU3	RGU2

XGLC · **XC**

XGP series – Dust-proof & drip-proof type

	XGP500	XGP600	XGHP600	XGP700	XGP800	XGP900	XGP1000
	8	8	18	18	18	18	18
	500	600	600	700	800	900	1000
	0,01	0,01	0,02	0,02	0,02	0,02	0,02
	0,01	0,01	0,01	0,01	0,01	0,01	0,01
	0,004	0,004	0,004	0,004	0,004	0,004	0,004
	200	300	200	300	400	500	600
	130	130	130	130	130	130	130
	300	300	400	400	400	400	400
	145	145	150	150	150	150	150
	200 (300)			200 (400)			
	360	360	360	360	360	360	360
	7600	8400	7700	8400	9200	9900	10600
	2300 (1700)						
	1700	1700	920	920	920	920	920
	0,55*4	0,56*4	0,57*4	0,52*4	0,58*4	0,59*4	0,59*4
	28 (29)	29 (30)	48 (50)	50 (52)	52 (54)	54 (56)	56 (58)
	0.2 sq x 20 wires; Ø 6 x 3						
	-	-	-	-	-	-	-
	-	-	-	-	-	-	-
	RGU3	RGU3	RGU3	RGU3	RGU3	RGU3	RGU3

XGLC/XC series – Clean type

	XC180	XC220	XGLC250	XGLC350	XGLC400	XGLC500	XGLC600	XC500	XC600	XC700	XC800	XC1000
	1	1	4	4	4	4	4	10	10	20	20	20
	180	220	250	350	400	500	600	500	600	700	800	1000
	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,02	0,02	0,02	0,02	0,02
	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01	0,01
	0,004	0,004	0,004	0,004	0,004	0,004	0,004	0,005	0,005	0,005	0,005	0,005
	71	111	100	200	250	250	350	250	350	350	450	550
	120	120	129	129	129	129	129	120	120	120	120	120
	109	109	150	150	150	250	250	250	250	350	350	450
	140	140	134	134	144	144	144	142	145	145	145	145
	100	100	150	150	150	150	150	200 (300)		200 (400)		
	360	360	360	360	360	360	360	360	360	360	360	360
	3300	3400	4500	5600	6100	5100	4900	4900	5600	6700	7300	8000
	700	700	1100	1100	1100	1100	1100	1700	1700	1700	1700	1700
	1700	1700	1020	1020	1020	1020	1020	876	876	600	600	600
	0,42*3	0,45*3	0,57*4	0,57*4	0,57*4	0,74*4	0,74*4	0,53*4	0,56*4	0,57*4	0,57*4	0,6*4
	6,5	6,5	17.5	18	18.5	21	22	31	33	57	58	59
	0.1 sq x 8 wires; Ø 3 x 2 — Class 10; Suct. vol. (Nl/min) = 30;		0.2 sq x 10 wires; Ø 4 x 4					0.2 sq x 20 wires; Ø 6 x 3 — Class 10; Suction volume (Nl/min) = 60;				
	-	-	XGLF	XGLF	XGLF	XGLF	XGLF	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-
	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	RGU2	RGU2	RGU2	RGU2	RGU2

The YRC is the smallest robot controller able to control the complete SCARA line-up. It is easy to use because it implements application functions while being a powerful tool that enables low-level programming.

Key features and benefits:

- Compact controller

- Simple programming by teaching pendant or software

- Advanced motion functions

- Absolute data

- Separate power source system: control + main power

- Up to 4 optional boards for increased functionality

- Integrated vision system and conveyor tracking function (optional)

YRC – ROBOT CONTROLLER				
Motion	Drive method	PTP (point-to-point) motion, arch motion, linear interpolation, circular interpolation		
	Coordinates	Cartesian coordinates, Joint coordinates, User coordinates, Tool coordinates		
	Position indication units	Pulses, mm (millimetres), deg (degrees)		
	Acceleration setting	Automatic acceleration setting based on robot model type and end mass parameter Setting based on acceleration and deceleration parameter (Setting by 1% unit, changeable in the program)		
		Zone control (optimum speed suitable for the arm position of the SCARA robot)		
Programming	Program language	Pseudo-Basic (Conforming to JBS B8439 SLIM language)		
	Multitasks	8 tasks	Sequence program	1 program
	Memory size	364 KB: Total of program and point data, 84KB: Size for program when maximum numbers of points is used		
	Programs	100 programs; maximum 9.999 lines per program; 98 kB maximum capacity per program		
	Points	10,000 points: maximum numbers of points		
I/O	Point-data input method	Manual data input (coordinate data input). Direct teaching. Communications. Teaching playback, off-line teaching (data input from outside)		
	Memory backup	Lithium battery (service life 4 years at 0ºC to 40ºC)		
	STD. DIO — I/O Input	General input: 16 points, dedicated input 9 points (NPN/PNP specifications selectable)		
	STD. DIO — I/O output	General output: 8 points, dedicated output 11 points		
	SAFETY — Emergency stop input	Relay contact		
	SAFETY — Service mode input	1 point (NPN/PNP specifications is set according to STD. DIO setting)		
	Brake output	Relay contact		
	External communications	RS232C: 1CH (D-SUB9 (female)) RS422: 1CH (for PB only)		
Basic specifications	Maximum power consumption	2500VA	Capacity of the connected motor	1600W
	Dimensions/Weight	W180 x H250 x D235 mm (main unit only) / 6,5 kg (main unit only)		
	Power supply voltage	Single phase AC200 to 230V, +/- 10% maximum (50/60 Hz)		
	Operating temperature	0ºC to 40ºC	Storage temperature	-10ºC to 65ºC
	Operating humidity	35% to 85% RH (non-condensing)	Noise resistance capacity	IEC61000-4-4 Level 3
	Battery for absolute data backup	Lithium battery, data retention time of 1 year		
Options	Parallel DIO board	General purpose input 24 points/board		
		General purpose output 16 points/board (4 boards maximum, compatible with NPN/PNP specifications)		
	DeviceNet, PROFIBUS	Dedicated input 11 points, dedicated output 11 points	General input 96 points, general output 96 points	
	Ethernet	Conforming to IEEE802.3, 10 Mbps (10BASE-T)		
	Vision board	Camera input (2ch), camera trigger input, PC connection input		
	Tracking board	AB phase input, lighting trigger input, PC connection input		
	Lighting control board	Lighting trigger input, lighting power input/output		
	Teaching pendant	PB	Software for PC	Scara Studio

PROGRAMMING TOOLS:				
TEACHING PENDANT				
	Display	40 characters 15 lines	Enabling switch	Optional
	Emergency stop switch	Normally closed contact point (with lock function)		
	Serial interface	RS-422: 1CH (dedicated to communication with controllers)		
	Operating temperature	0 to 40ºC	Operating humidity	35 to 80% RH (non-condensing)
	Weight	600g	Cable length	5m, 12m (option)
	Dimensions	W 180 x H 250 x D 50 mm (Note: projection of emergency stop button is not included.)		
SOFTWARE				
	Scara Studio	Programming, setup and backup function.		

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