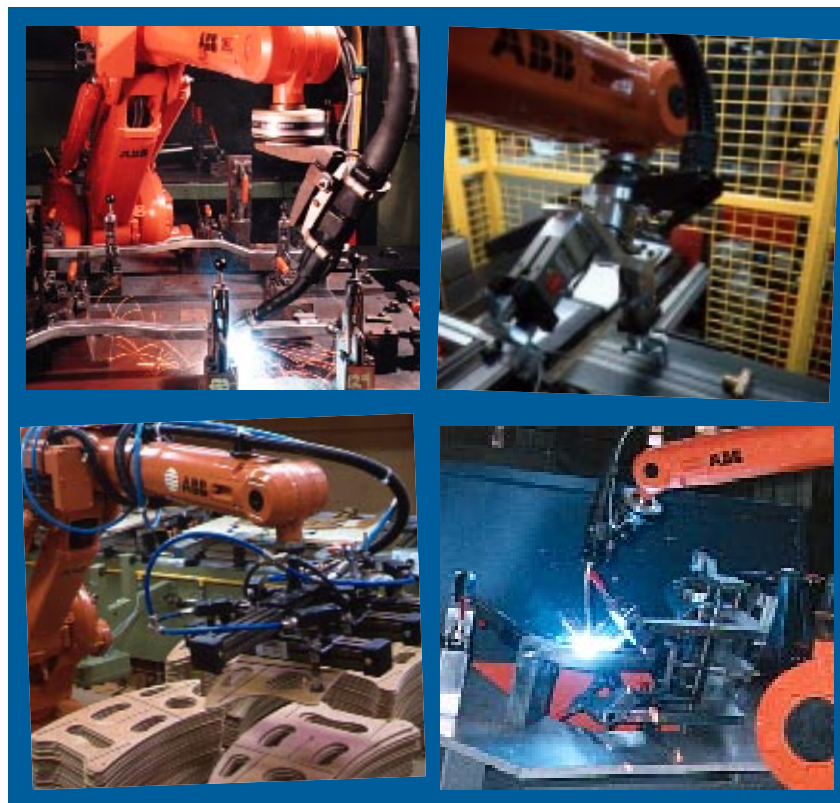


Fast & accurate



IRB 1400 Industrial Robot

ABB Flexible Automation

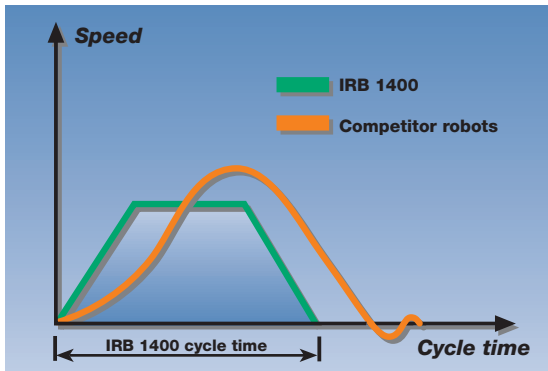


IRB 1400 – Your best performer

Fastest workcycle times for the highest productivity

Most accurate path-following for the highest workpiece quality

Highest reliability for disturbance-free manufacturing

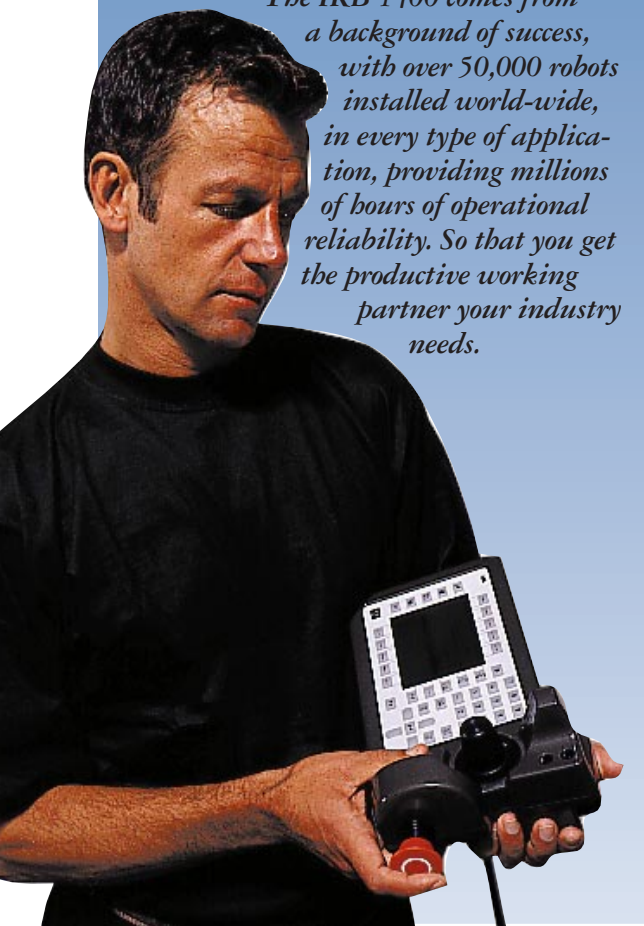


Dynamic model control enables the most rapid TCP acceleration and deceleration. Cycle times are the fastest in the industry and do not depend on the speed of individual axes.

Industries demand high production rates, reduced lead times, smaller inventories and lower costs. Demands which are met by the IRB 1400 robot.

It provides short workcycle times, rapid change-overs and consistently high process quality. The IRB 1400 and its reliable process-optimised equipment meet the needs of modern industry.

The IRB 1400 comes from a background of success, with over 50,000 robots installed world-wide, in every type of application, providing millions of hours of operational reliability. So that you get the productive working partner your industry needs.



The fastest workcycle times – QuickMove™

IRB 1400 is designed for fast and reliable workcycles. The unique self-optimising control system ensures that at least one robot axis is driven at maximum motor torque at all times during robot motion and reorientation. Every robot axis works at optimum acceleration and deceleration. The result is the fastest workcycle times available for arm-type robots – without the need for program trimming. Tests at customer sites have proved that IRB 1400 cycle times are up to 25% faster than competitive equipment. The more reorientation and corner paths, the bigger the advantage for IRB 1400. Your productivity will increase using the IRB 1400 in your manufacturing cell.

Most accurate path-following – TrueMove™

The dynamic-model system control ensures a high path-following accuracy regardless of robot speed. The path through corners can be defined by the user, and this same path will be followed even after changing the robot speed and/or orientation.

The result is excellent work quality, and the ability to adjust process speed and position to achieve optimum manufacturing accuracy with little or no rejects.

High reliability and safety

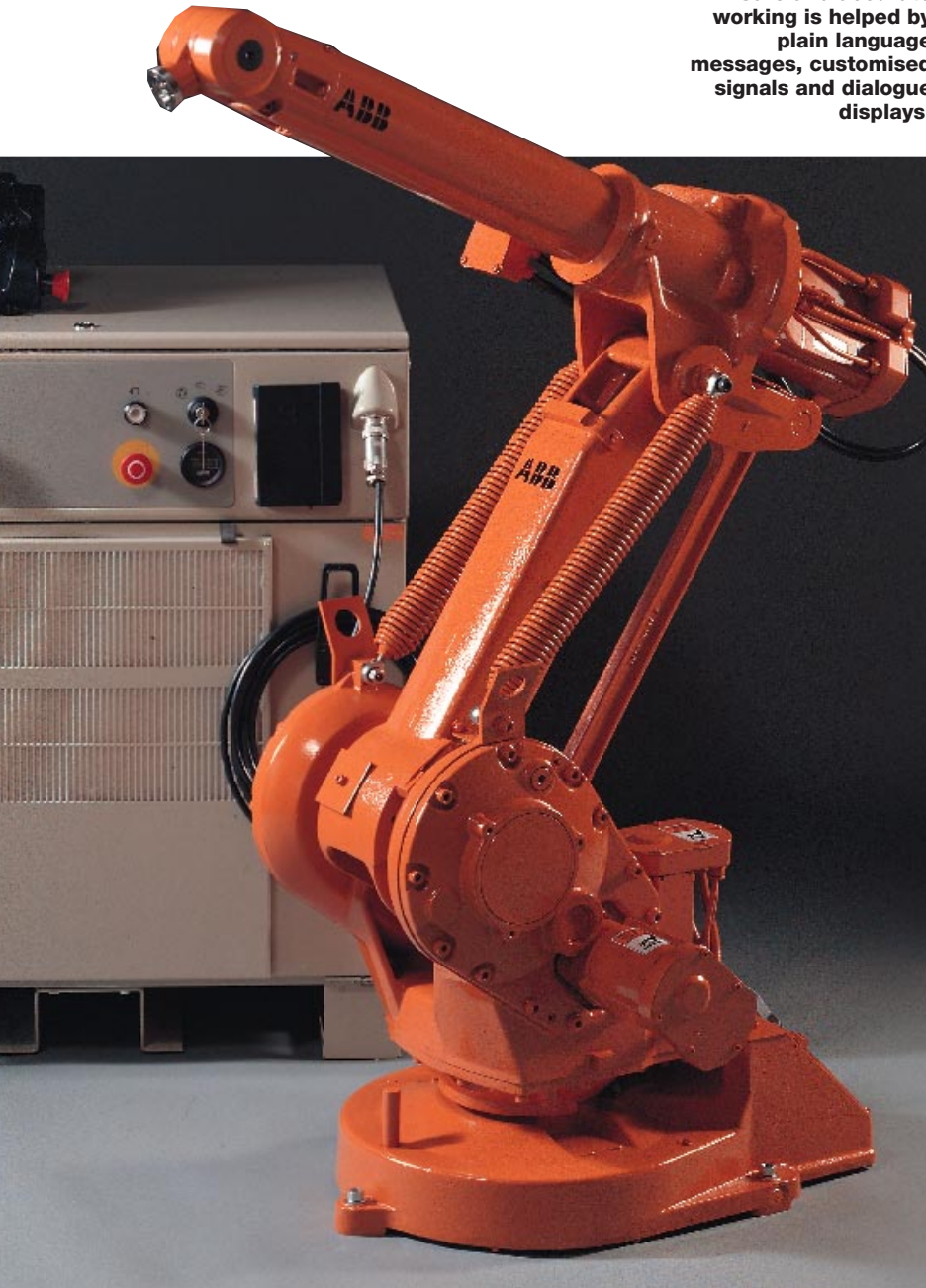
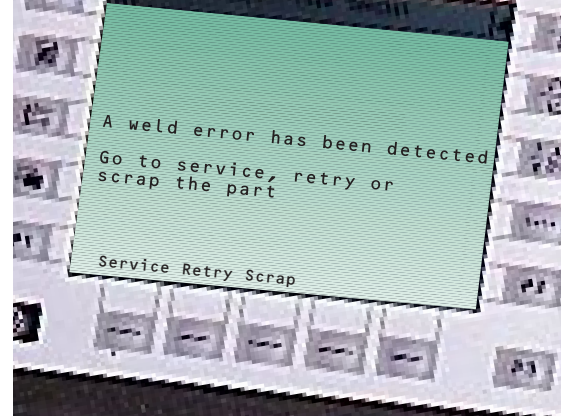
The IRB 1400 is stiff and robust, offering low noise levels and long intervals between routine maintenance. This is achieved by a well balanced arm construction, double bearing joints and the torque-bar on axis 3, together with the use of maintenance-free gearboxes and cabling. The drive train is optimised to give high torque with the lowest power consumption. Together with the new S4C controller the robot MTBF (Mean Time Between Failure) has more than doubled since 1993.

Operator and workplace safety are primary concern. Careful and safe system design and construction are supplemented by active safety devices. Two independently supervised safety circuits can also protect the surrounding work cell. Software is protected by passwords to avoid unauthorised activation and to protect programming from tampering. A 3-position enable device and hold-to-run key help to avoid inadvertent robot movement.

The design results in a highly reliable system with low power consumption and high uptime.



Safe and accurate working is helped by plain language messages, customised signals and dialogue displays.



Extensive functionality – adaptable to your specific needs

The S4C controller includes extensive functionality. The system can be configured to the user's specific needs – with the user's own names on signals and on dialogues, and with the functions chosen by the user available on the display.

- Movement of workpiece positioners can be coordinated with the robot, and drive control integrated with the robot controller.
- "Interrupt" programs and recovery procedures can be started when input signals indicate error conditions.
- After a stop command or power failure, the robot can restart a workcycle where it left off, or carry out a pre-programmed recovery procedure.
- Serial and Ethernet links provide industry standard communication with PC and other equipment. Fieldbus is available for signals, distributed devices and PLC connection.

Robot software products

DeskWare™ is an extensive library of software products which allows you to run the robot programs on your PC for off-line training, programming, editing and storage, leaving the robot free for use in manufacturing. This means that valuable production time is not wasted when training or programming. The robot can be monitored and controlled from a PC workstation with the help of FactoryWare™ software products.

Dedicated, powerful software programs are available for processes such as arc welding and palletising. ArcWare™ software includes complete functionality for MIG, MAG and TIG welding on fixed tables and moving workpiece positioners. It includes functions for fast arc-strike, different weaving patterns and finishing procedures. Process monitoring and supervision functions are also available.

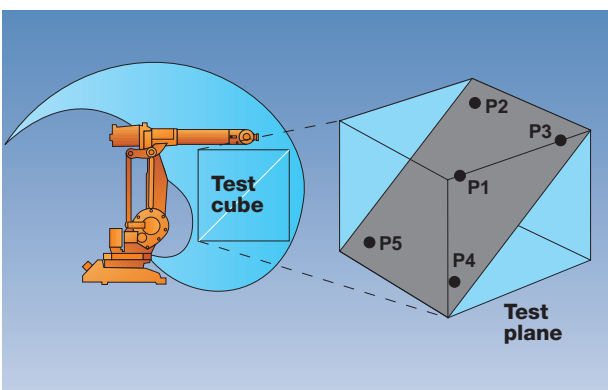
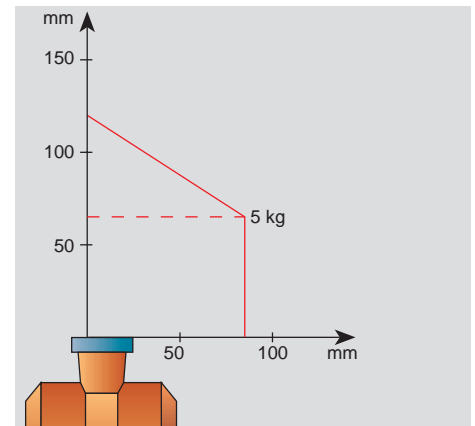
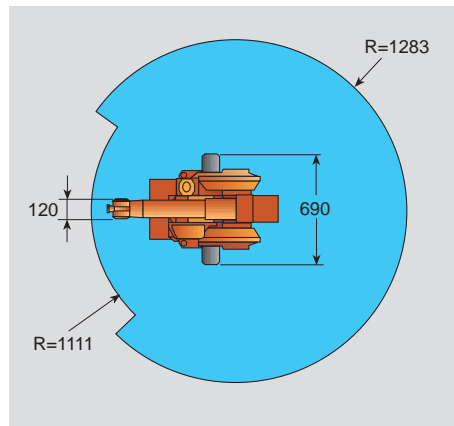
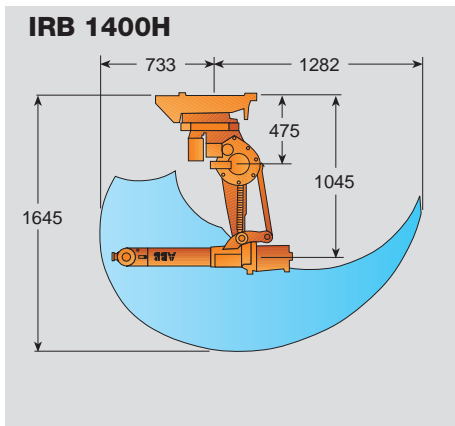
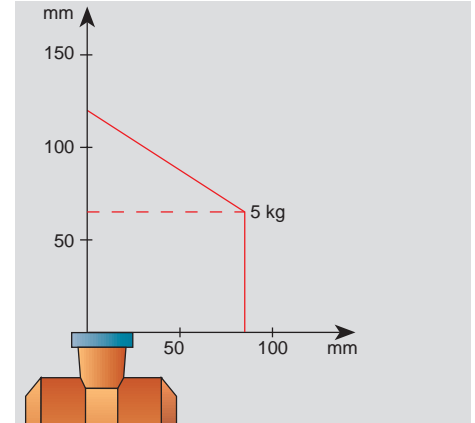
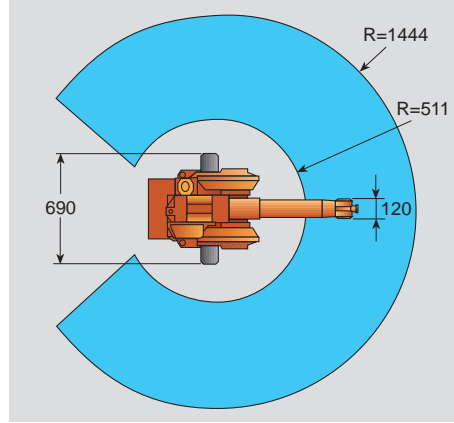
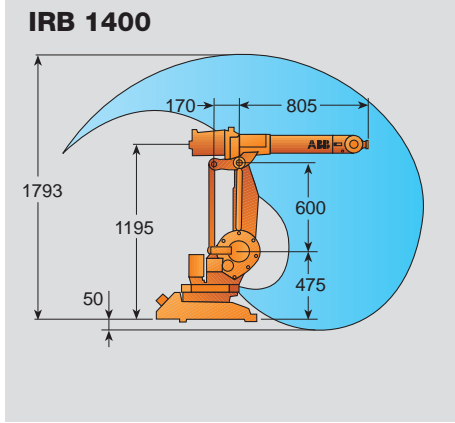
Support and assistance when and where you need it

Working closely with users in many applications and many different countries we have extensive knowledge and experience of robot operations. Experience which is translated into user benefits. Support is available from local centres in more than 30 countries. This means that we can ensure that uptime is maximised with planned schedules of maintenance to avoid unforeseen stoppages. Making certain that you get the most from your investment.

DeskWare™ is an extensive library of software products which allows you to run the robot programs on your PC for off-line training, programming, editing and storage, leaving the robot free for use in manufacturing.



Working Range and load diagram

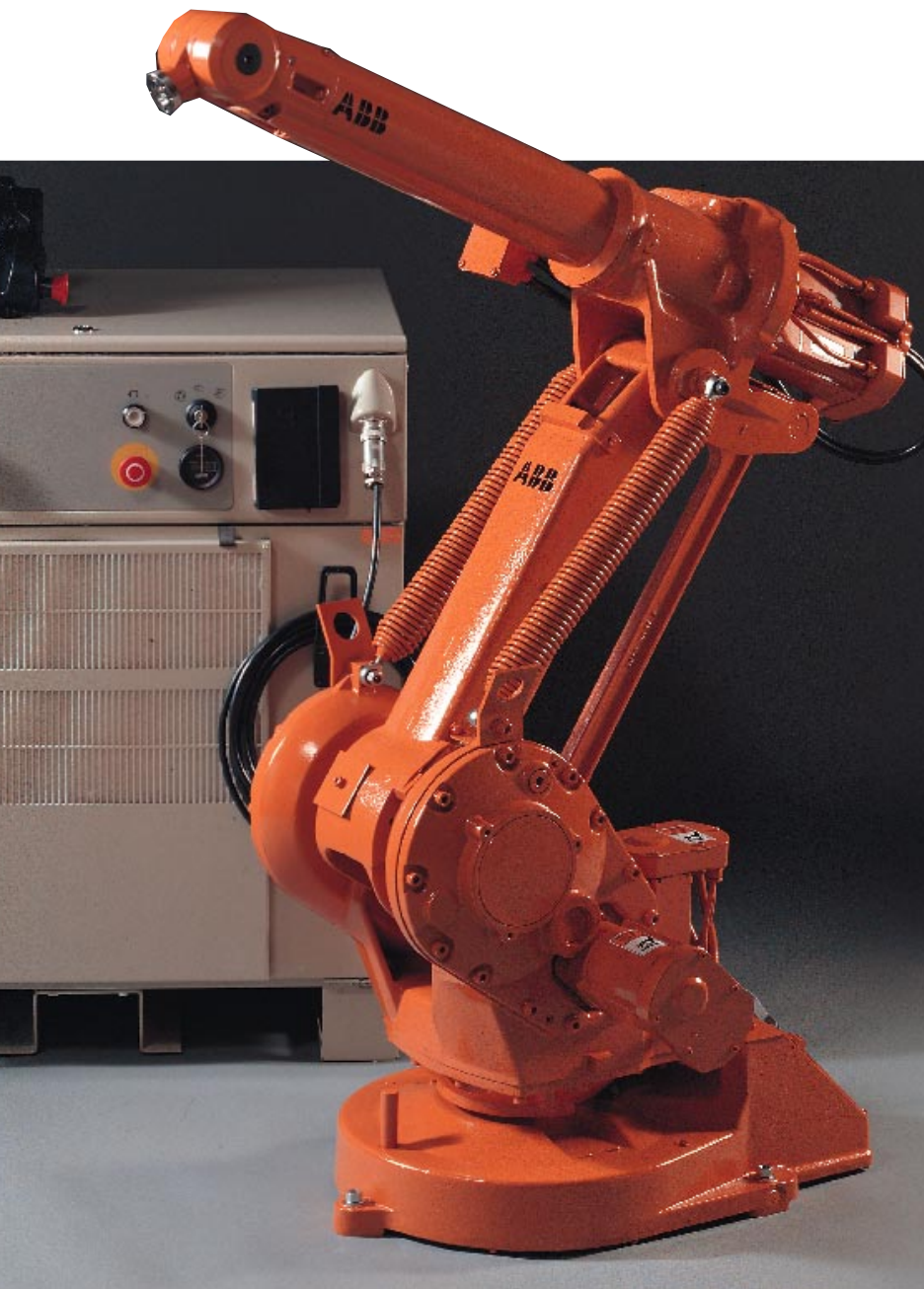


Average values of tests carried out on the inclined ISO test plane with all robot axes moving.

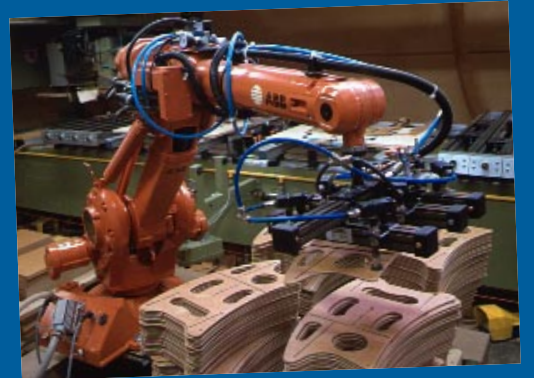
Examples of ISO test results at rated load and speed

ROBOT TYPE	IRB 1400	IRB 1400H
Rated load	5 kg	5 kg
Rated speed	1 m/s	0.5 m/s
Max. velocity	2.1 m/s	1.3 m/s
Repeatability RP	0.04 mm	0.04 mm
Linear path accuracy AT	1 mm	0.84 mm
Linear path repeatability RT	0.16 mm	0.21 mm
Circular path repeatability RT	0.33 mm	0.21 mm
Minimum positioning time to 0.2 mm		
on 35 mm linear path	0.2 sec	0.3 sec
on 350 mm linear path	0.55 sec	0.6 sec
Average power consumed on ISO test paths	130W	150W

"Rated speed" designates test speed, according to the ISO standards.



The hanging variant IRB 1400H offers high performance when floor-space is restricted, and when a large work-processing area is required.



Technical data

IRB 1400 industrial robot

SPECIFICATION

Robot versions	Handling capacity	Reach of 5 th axis	Remarks
IRB 1400	5 kg	1,44 m	Hanging
IRB 1400H	5 kg	1,28 m	
Supplementary load			
on axis 3		10 kg	
on axis 1		19 kg	
Number of axes			
Robot manipulator		6	
External devices		6	
Integrated signal supply			
12 signals on upper arm			
Integrated air supply			
Max. 8 bar on upper arm			

PERFORMANCE

Positional repeatability	±0.05 mm	
Movements		
	IRB 1400	IRB 1400H
Max. TCP velocity	2.1 m/s	1.3 m/s
Max. TCP acceleration	15 m/s ²	13 m/s ²
Acceleration time 0-1 m/s	0.16 sec.	0.15 sec.
Continuous rotation of axis 6		

ELECTRICAL CONNECTIONS

Supply voltage	200–600 V, 50/60 Hz
Rated power,	
Transformer rating	4 kVA

PHYSICAL

Robot mounting	
1400	Floor
1400H	Floor or hanging
Dimensions	
Robot base	620 x 450 mm
Robot controller H x W x D	950 x 800 x 540 mm
Weight	
Robot unit	225 kg
Robot controller	240 kg

ENVIRONMENT

Ambient temperature	
Robot unit	5 - 45°C
Robot controller	5 - 52°C
Relative humidity	Max. 95%
Degree of protection	Class D (dry) for welding, machining etc.
Noise level	Max. 70 dB (A)
Safety	
Double circuits with supervision, emergency stops and safety functions, 3-position enable device	
Emmission	EMC/EMI-shielded

MAN-MACHINE-INTERFACES

Operators' panel	In cabinet or external
Control pendant	Portable with joystick and keypad. Display 16 lines x 40 characters. Window style communication. 3 position enabling device, back lighting 5 user-definable keys.
Languages	Choice between 10 national languages
Printer	Interface for printer
PC	
DeskWare software	"The S4C software on your PC" QuickTeach training Off-line programming VirtualRobot simulation Monitor and control of robots from PC
FactoryWare software	
RRS Simulation	From simulation companies

MACHINE INTERFACES

Digital inputs/outputs	Up to 512, 24 V DC, 120 V AC or relay outputs
Analogue inputs/outputs	Up to 120, ±10 V and ±20 mA
Serial channels	One RS 232 and one RS 485
Network	Ethernet
Fieldbus	CAN Allen Bradley PLC Interbus-S Profibus
Process Interfaces	Media and signals on upper arm

EXAMPLE OF ARC WELDING EQUIPMENT AND FUNCTIONABILITY

Process equipment	Weld power sources Wire feed systems Welding torches Workpiece manipulators
Examples of process signal interface	Status of arc, voltage, current, water, gas, wire feed (DI) On/off of power, gas, wire feed, error information (DO) Value of wire feed velocity, voltage, current (AO)
Examples of ArcWare™ functions	General power source interface Process tuning of welding parameters during program execution (hot edit) Weld-retry, including "go-to-service" routine Weld error report and logging Arc start/end Material pre-heating/cooling Scrape start Crater filling Wire burnback Weaving pattern definition Monitoring of arc data, seam coordinates wire, water, voltage, current, gas
Diskette drive	3.5" MS-DOS
Robot vision	OptiMaster

Data and dimensions may be changed without notice.



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