

ABB Original Paint Application Equipment

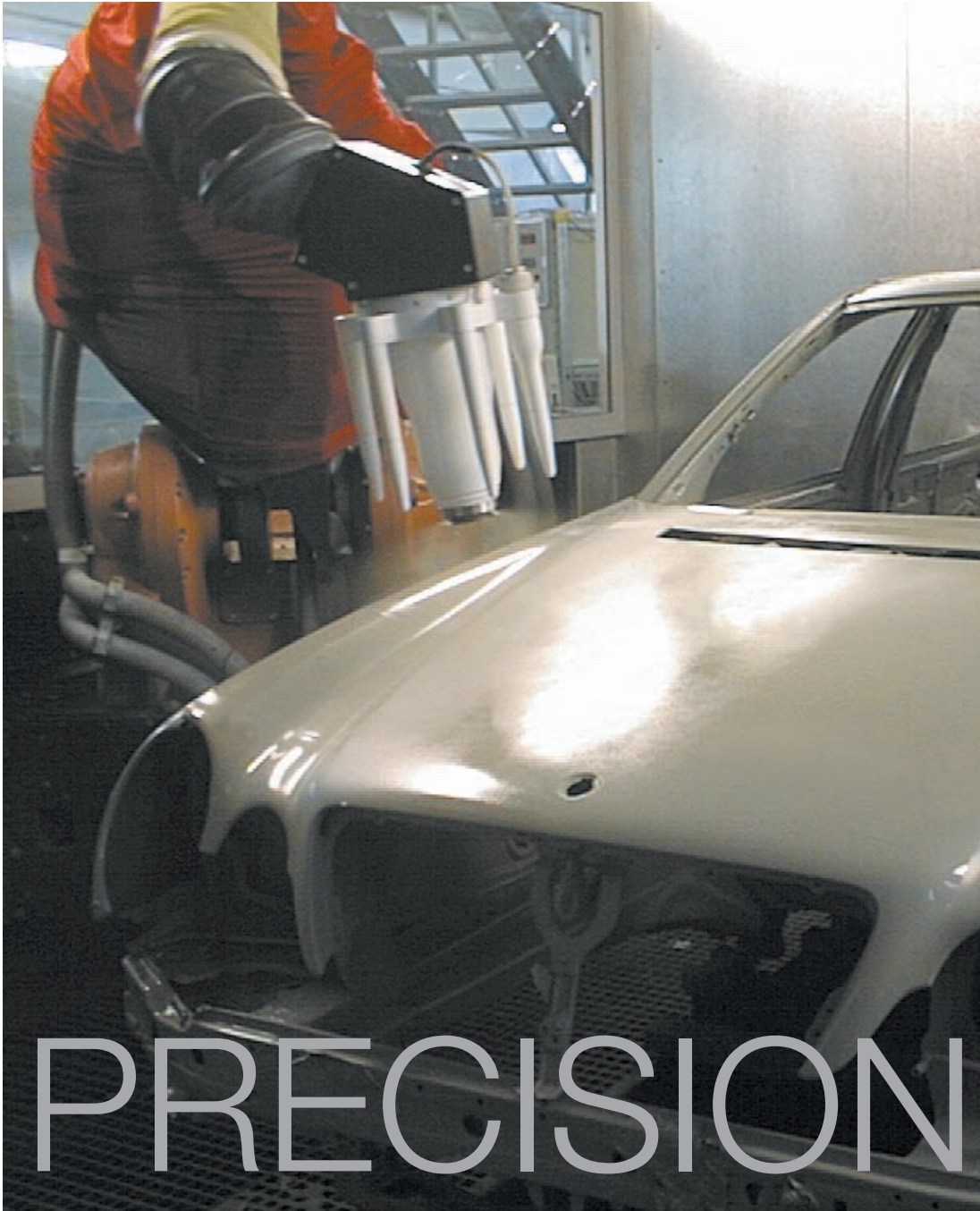
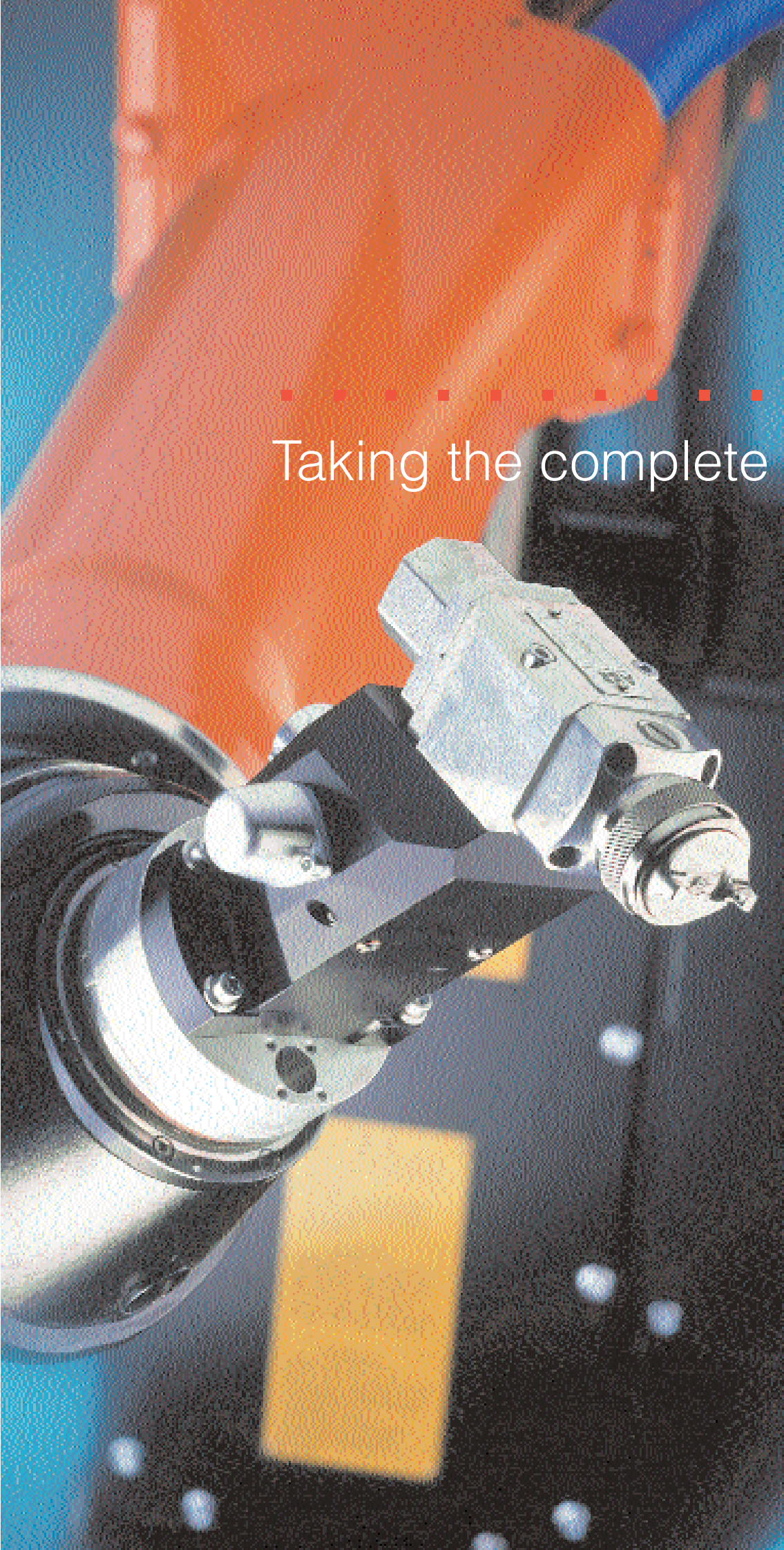


ABB Automation





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Taking the complete

▪ ▪ ▪ ▪ ▪ ▪
painting pro

Precision can only be achieved by focusing on the entire process. ABB's Original Paint Application Equipment has been optimised for all parts of the painting process through years of extensive research and development, in close co-operation with the world's most demanding end users. The result is higher finish quality, increased uptime, reduced paint consumption and substantial cost and energy saving.

Process closer to perfection

ABB's Original Paint Application Equipment is more than state-of-the-art technology. It is also a vast network of experience and know how which can help tuning or re-designing your paint process for better results. An example of this is the pre-engineered ABB Function Packages which are optimised for precision performance. By choosing both the robot system and the paint application equipment from ABB, you will have one partner with in depth knowledge of the entire paint process. One responsible partner with the complete ability to take your paint process closer to perfection.



Table of contents

4 - 9
Atomisers

10 - 15
*Regulators, distributors
and sensors*

16 - 19
Paint Kitchen



ABB Metabell™ Technology

The Metabell™ function combines the high transfer efficiency of a bell with the versatility of a conventional air spray gun. This unique combination offers a cost effective, paint saving solution and a high quality metallic finishing equal to, or better than those provided by conventional gun atomisers.

ABB Metabell™ atomisers can apply water borne and solvent based paint materials for both first and second layer metallic applications.

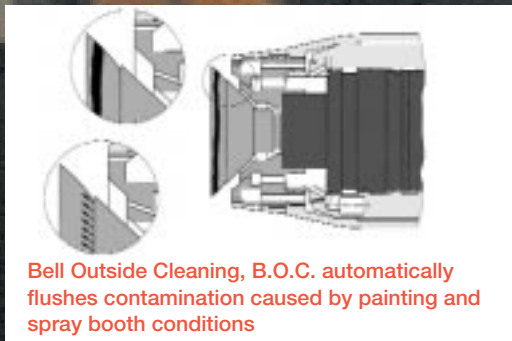
To optimise transfer efficiency the spray pattern width is adjustable by regulating the shape-air flow.

Real Transfer Efficiency (TE)

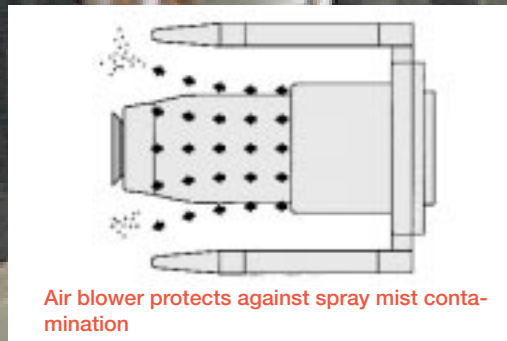
Minimising waste is not necessarily achieved by simply using the application technique that has the highest rated transfer efficiency. "Real" transfer efficiency depends on a number of other factors including:

1. Finish quality.
2. Production rate.
3. Product shape.
4. Desired/required film thickness.
5. Uniformity of applied film thickness.
6. Edge build-up.
7. Need for manual touch-up/Faraday cage effects (in electrostatic spraying).

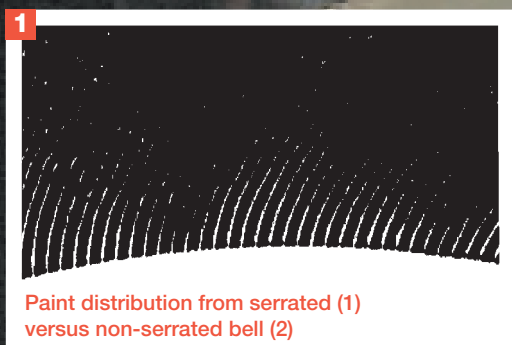
Real transfer efficiency also depends heavily on solids content, wet film thickness, application equipment and operator experience. Therefore, when considering a change in paint application methods to improve transfer efficiency, careful testing should be done to ensure that paint and solvent waste are truly being minimised.



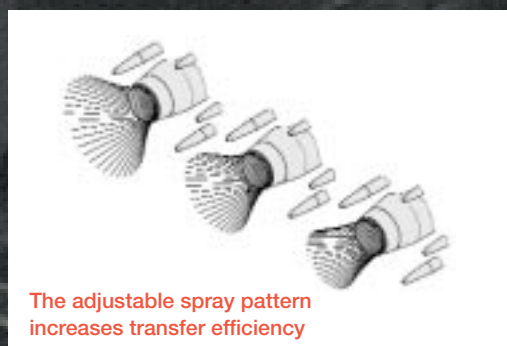
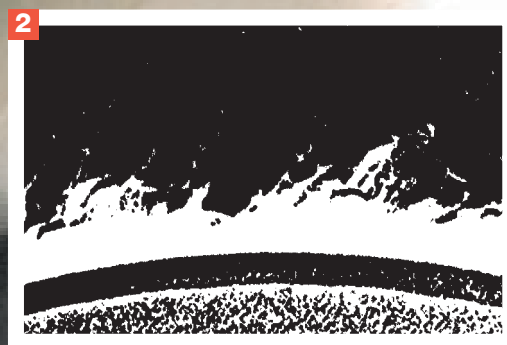
Bell Outside Cleaning, B.O.C. automatically flushes contamination caused by painting and spray booth conditions



Air blower protects against spray mist contamination



Paint distribution from serrated (1) versus non-serrated bell (2)



The adjustable spray pattern increases transfer efficiency

G1 Copes Bell with ABB Metabell™

The G1 COPEES BELL provides excellent metallic finishing quality. Several upgraded contamination preventive functions gives the G1 Copes a superior transfer efficiency (TE).

Features:

- Metabell™ function.
- Purging air. Effectively prevents contamination by supplying air from the back of the bell cup rim.
- Air blower. Protects against contamination of spray mist.
- Bell Outside Cleaning (B.O.C.).
- Hydrophobic "contamination proof" coating.

Technical data:

High voltage:	Max. -80KV, Max 800µA
Paint flow rate:	Max. 500 cc/min
Rotation:	Max. 35000 rpm, with Fibre optic detection
Spray distance:	Approx. 200-220mm
Spray pattern width:	Approx. 250-550mm

Robobel 925

The Robobel 925 is a solvent based applicator, specially designed for Robotic applications, for spraying 1st & 2nd layer base coat metallic.

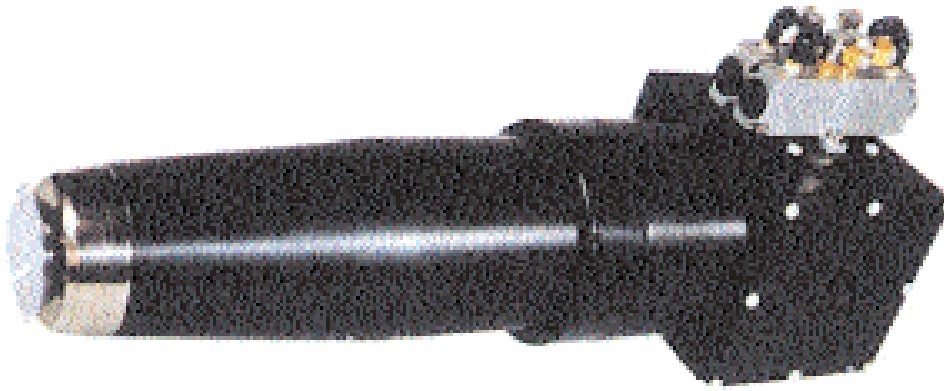
Use the Robobel 925's Metabell function and a 70mm diameter serrated bell cup for a superb finish quality with optimised colour matching for base coat metallic.

Robobel 925 is also able to apply primer coat, solid colour and clear coat.

Features

- 5.3 kg weight, with a valve unit including Trigger, Dump and Solvent valves.
- Pack-in cascade (-90KV)
- 30, 50 & 70mm diameter Bell cup
- Easy remove design
- Metabell function
- Length 470mm (120° angled)





Rotation controller



High Voltage Controller

To increase TE with a Bell atomiser:

1. Lower the rotation speed.
2. Lower the shaping air pressure.
3. Shorten the spray distance.

To accomplish satisfactory metallic finishing:

Finish quality of metallic results in a lighter appearance.

1. Increase the shaping air-flow.
2. Increase the rotation speed.
3. Thinner second stage film thickness
4. More overlap coating.

µµ Bell 923 (micro-micro Bell)

The µµ Bell 923 is a solvent borne applicator designed for application of 1st & 2nd layer base coat metallic with increased transfer efficiency.

A -90kV pack-in cascade power supply allows for extremely safe operation and slim design.

The µµ Bell 923 can apply clear coat, solid colour and primer coat with the same excellent performance as for base coat metallic.

Features:

- Serrated 30, 50 & 70mm diameter bell cup with the appurtenant Shape air ring.
- Pack-in cascade power supply (-90KV)
- Built in trigger and dump valves at rear plate
- Easily removed, compact air motor
- Length 550mm, weight 6.8Kg

Rotation- and High Voltage Controllers

1. Rotation controller

When using a rotary atomiser, the rotation controller functions as a speed sensor for the built-in air turbine in the atomiser. The rotation atomises the paint material in-stead of the "usual" atomising of the paint material, as used in conventional air spray guns. The rotation speed is set from the IPS brush file (a numeric value) and, the analogue signal from the IPS is converted to an air flow by the air regulation unit, and monitored via fibre optic detection from the turbine.

2. High voltage controller

The high voltage controller controls the electrostatic field used to charge the paint mist to give higher transfer efficiency and a more uniform paint thickness. Electrostatic charging may be used for both water borne and solvent based paint materials. When using this function for water borne materials, a special concept of externally charging the paint, or a device to block voltage leakage through the paint supply line, is mandatory.

Atomisers

Conventional & HVLP air spray guns.

The automatic flange-mounted air spray guns are suitable for most applications. HVLP (High Volume Low Pressure) is characterised by high air volume at low pressure for paint atomising. This gives a reduced over spray while still having fine atomisation as on the conventional spray gun.

Both versions are available with a variety of air caps and fluid tips to fit the required application.

By using a flange-mounted gun, the gun may be easily replaced without disassembling air or fluid lines.

Technical data:

Length: 155mm,
Width: 50mm
Height: 48mm

Max. Pressure: 9 bar P1 (Atomising Air ATOM
and Fan Air FAN)
14 bar P2 (Material MAT)
4.5 bar P3 (Cylinder Air CYL)
0.7 bar at the Air Cap (for HVLP)

For consistent operation, the air pressure should be regulated and free from oil mist and water condensate.



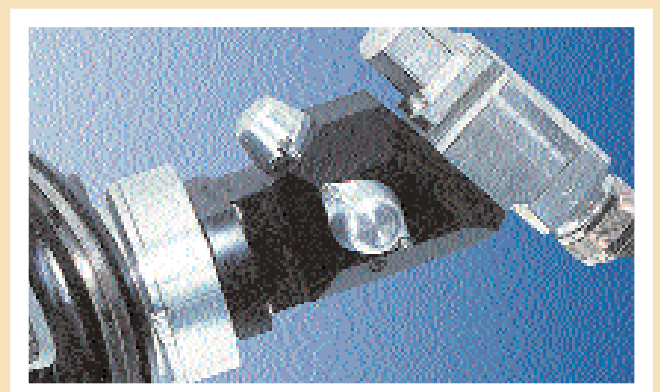
Attachments

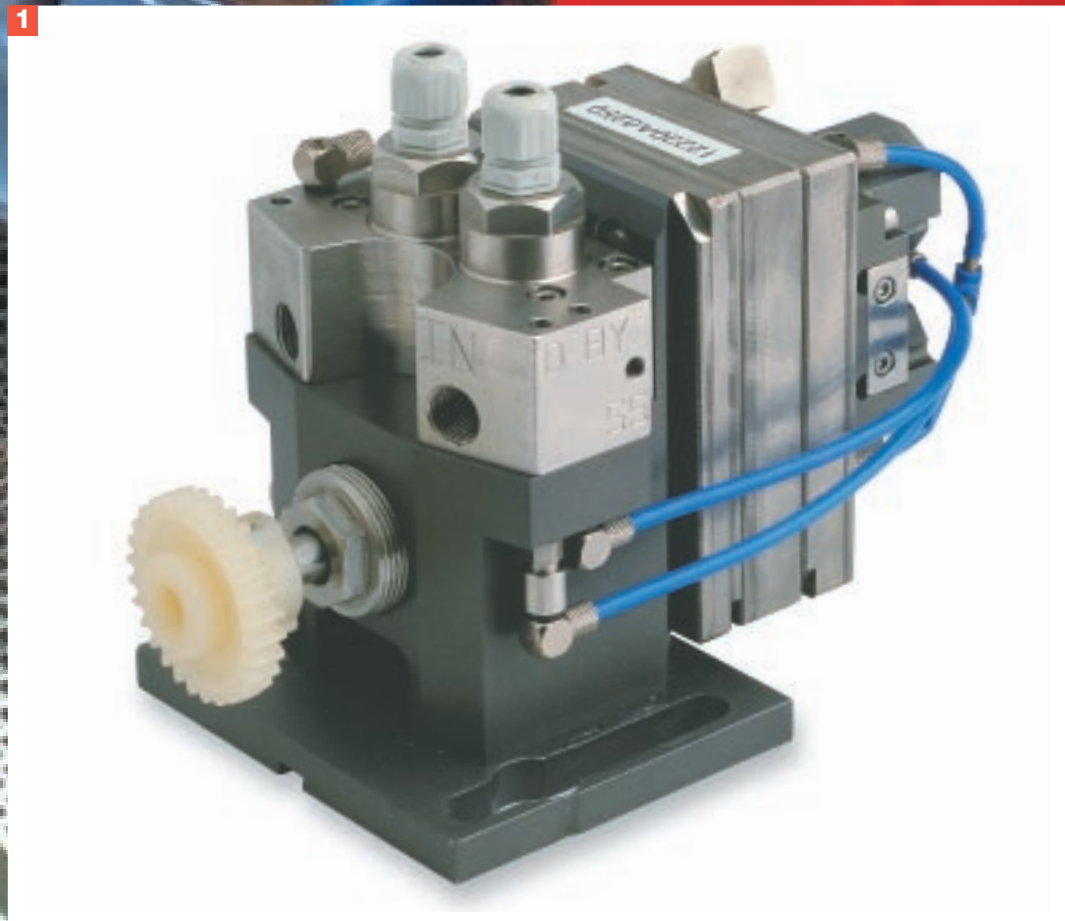
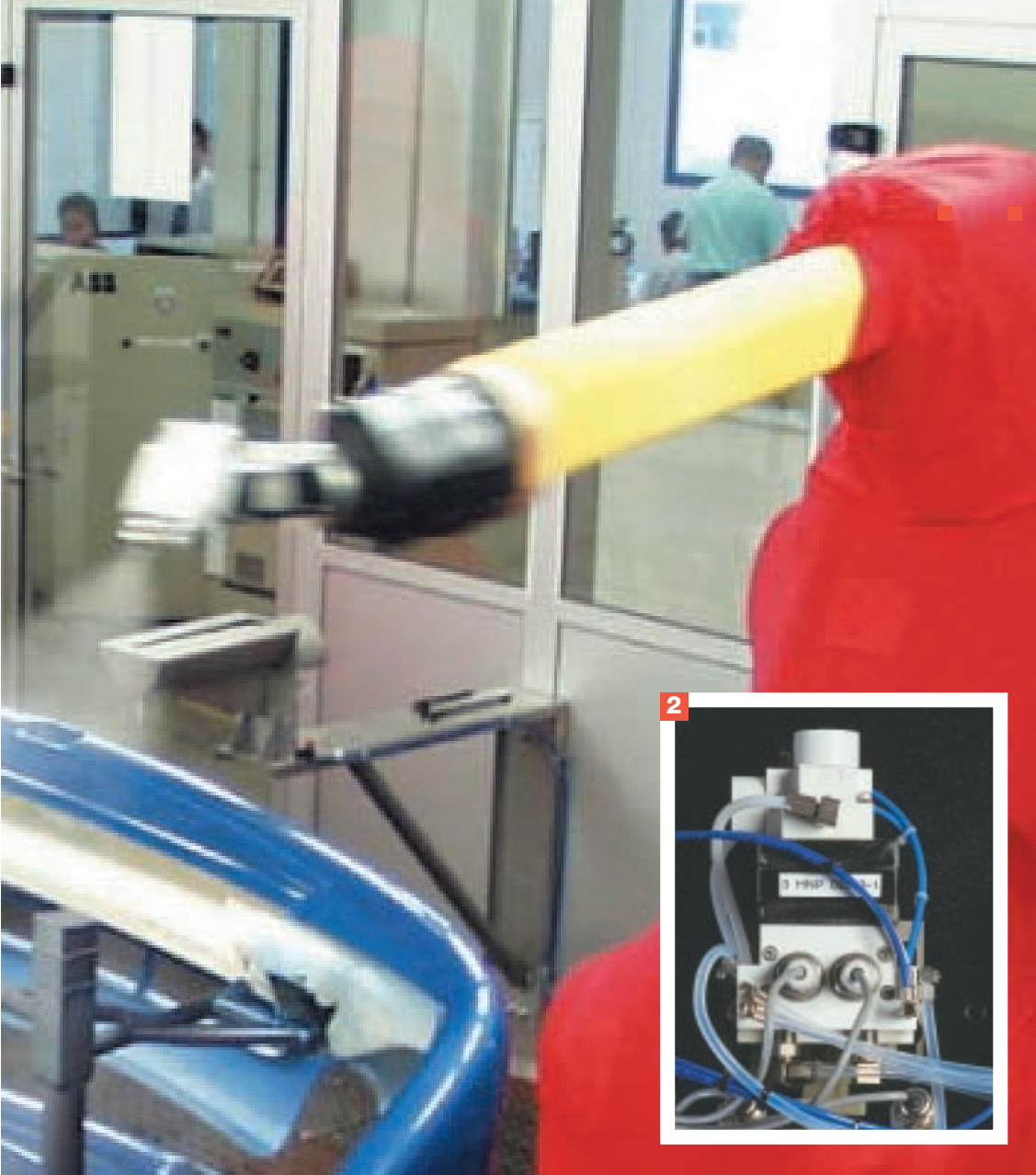
ABB has developed a variety of attachments for the spray guns giving the possibility to add a dump valve as close to the gun as possible.

Other functions in the attachments are:

- A/B colour change function
- 2 component (2K) mixer
- Dual gun

The attachments are available with various TCP (tool centre point) angles. 60° is usually used.





The ABB Flushable gear-pumps for superior cleaning

The ABB flushable gear pumps are especially prepared for optimised cleaning before colour change.

The ABB cleaning function cleans the pump from the inside and out and uses the main stream solvent in addition to adding cleaning solvent where needed. This results in a fast, efficient and less solvent consuming cleaning process.

ABB dosing pumps are fitted with a by-pass to allow main stream cleaning to be as effective as possible.

A special shaft cleaning procedure has been designed to prevent paint around the gear pump axle from contaminating the next paint material. This also serves as paint leakage prevention. The paint will be detained in the shaft solvent instead of clogging the gear axle.

1
ABB flushable steel pump

2
Plastic pump mounted on vertical arm

Regulators, distributors and sensors

Dosing Pumps

ABB's dosing pumps are available in stainless steel and "plastic". The main difference is the unit weight. Both are based on the same gear housing (in stainless steel) and have similar flushing and cleaning functionality. The plastic version is equipped with cartridge valves for fast and easy maintenance.

Technical data:

Max speed (revolutions): 150rev./min during painting,
40rev./min with cleaning agent.

Fluid Regulators

HGS / DR-1

Paint regulators are among the most important single units with respect to accurate paint regulation and uniform paint thickness. ABB's paint regulators are available for special regulation ratios and high accuracy.

As a rule of thumb: the diameter of the membrane is usually an indication on the regulation accuracy of the paint regulator. The membrane on ABB's regulators is 70mm in diameter.

Paint regulator #1 HGS

Fluid inlet pressure: Min: 3.5Bar, Max 20.7Bar
Regulated fluid: Min: 0.15Bar, Max 6.8Bar
Fluid flow rate: From 150cc up to 1000cc
Inner volume: Non circulating version 5ml

Paint regulator #2 DR-1

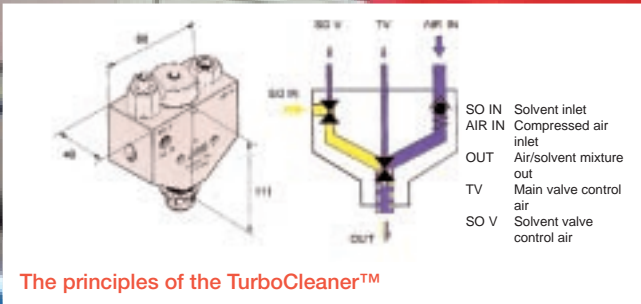
Fluid inlet pressure: 5.5-6.8Bar
Fluid outlet pressure: Variable by ratio (1:2 others 1:3,
1:4, 1:6, 1:8, 1:10)
Dimensions: Height 48mm, Diameter 70mm
Connections: Air pilot: Ø6mm
Fluid inlet: 1/4" BSP
Fluid outlet: Ø4x6mm

Paint regulator #2

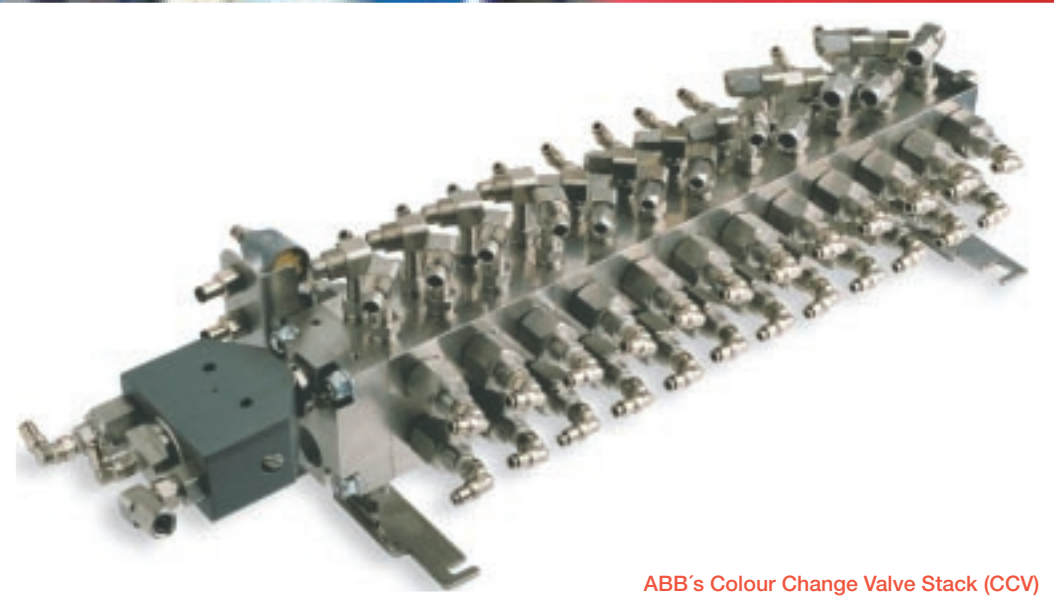




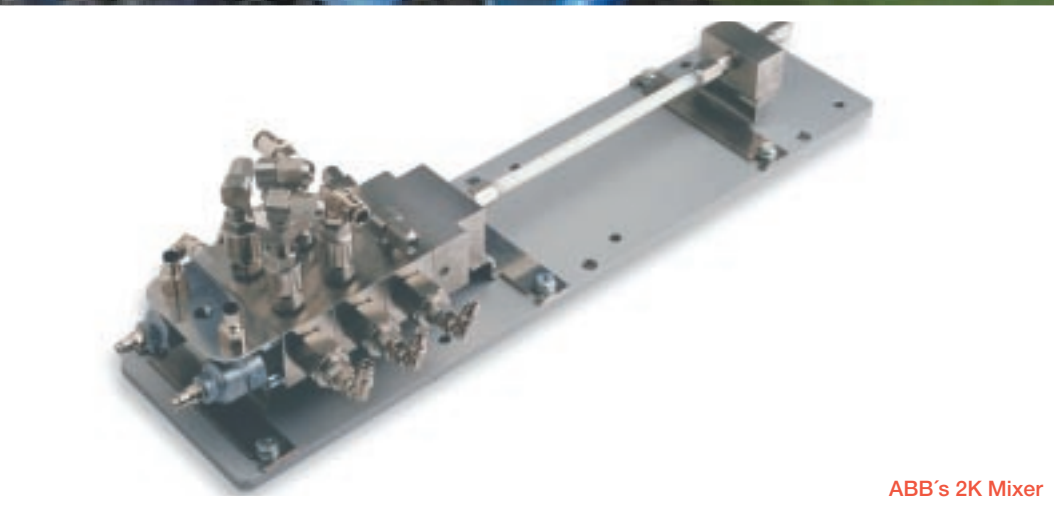
Air Regulation Unit



The principles of the TurboCleaner™



ABB's Colour Change Valve Stack (CCV)



ABB's 2K Mixer



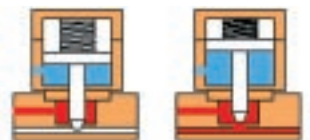
IPS – the intelligent paint solution

ABB's Integrated Process System (IPS) features closed loop regulation and high-speed control of paint and airflow adjustment. The system ensures a uniform film build with a specified thickness over the entire object. This ensures a high finish quality and optimum use of paint material.

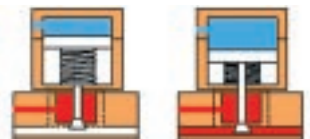
The IPS also increases transfer efficiency by synchronising the gun needle and paint flow triggering with the robot arm motion.

Choosing the right valve type

What the valve is supposed to block should also determine the choice of valve type. If a valve is used in a function where back pressure is possible, the valve should not be forced open if a back pressure occurs. If the valve is considered critical for leakage, it should be possible to change the valve including the valve seat in one unit.



Valve type 1



Valve type 2

Regulators, distributors and sensors

Air Regulation unit:

The purpose of the air regulator is to supply the correct airflow required for shaping the paint mist into an applicable brush.

Air regulators are controlled by use of analogue outputs from the IPS system and are normally mounted in the robot arm for faster response time.

Paint Flow Sensor:

Accurate volumetric paint control requires a flow sensor on the paint line. This may be a gear flow sensor, or other types of fluid sensors. The main purpose is to give the IPS feedback concerning the current paint flow and, if necessary, allow for adjustments.

ABB's "Fail Safe" Colour Change Valve with TurboCleaner™

The ABB colour change valves are based on a fail safe stainless steel cartridge. Backpressure on the valve unit (fluid section) will close the valve seat instead of forcing it to open, thereby preventing mixing of two fluids.

ABB's TurboCleaner™ has been based on a cartridge valve design. It generates a turbulent mist of solvent and air for more efficient cleaning. This is especially efficient on hose lines, supply lines and dump lines.

It is important to have a stable solvent and air supply pressure to generate the most efficient mist and obtain the best possible cleaning effect.

2K Mixer (2 component mixer)

The 2K mixers from ABB have been based on the same cartridge valve design as the CCV. Two separate modules for hardener (catalyst) and paint are supplied with separate cleaning units with solvent and air possibilities. The two groups are combined before entering the mixing tube. The tube is an easy exchangeable plastic tube.

Air Flow Sensor:

Air flow sensors give the IPS full control of the paint process and ensure that the air used for shaping the paint pattern and atomising the paint before applying it to the object, is according to the specific flow rates.

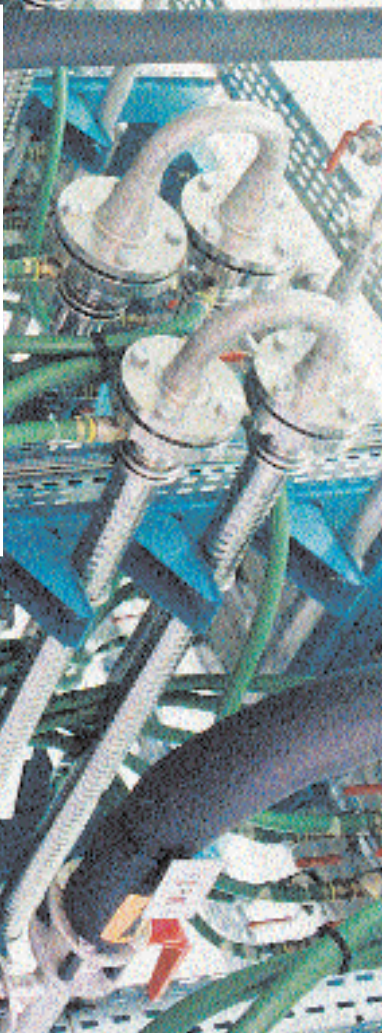
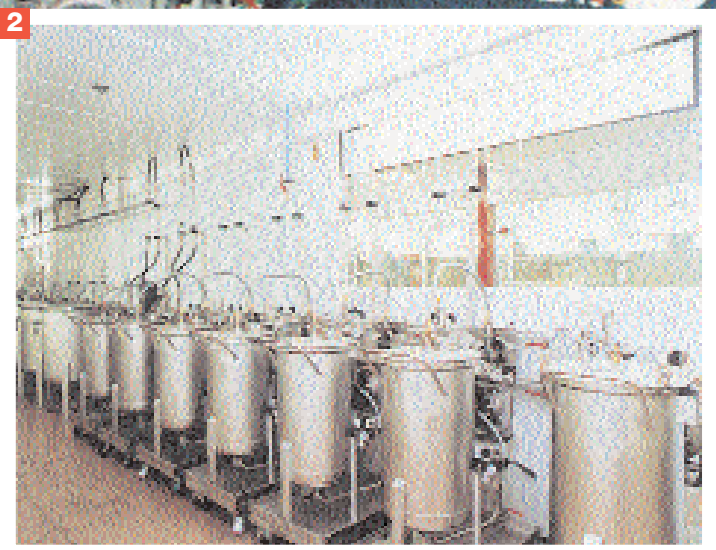
The required flow rate may vary. More than 500 l/min may be required for a spray gun application.

An airflow of up to 1000l/min may be needed for a bell application.



Air Flow Sensor





Retention free equipment

ABB's retention free Paint Kitchen equipment has been designed to avoid contamination and paint "stress". This means that all pipes, fittings, bends and curves are shaped in ways that will not damage the paint particles. Modular design also makes the Paint Kitchen equipment easy and less cost consuming to maintain.

Paint Kitchen

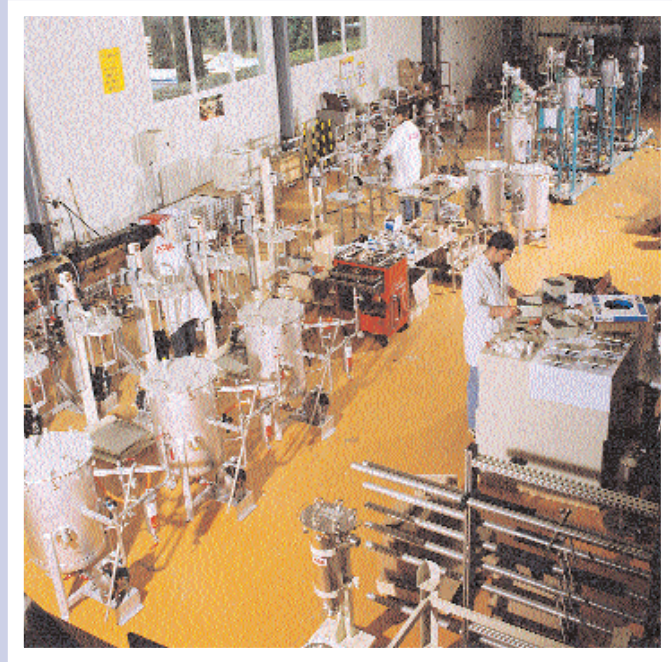
■ **Paint Kitchen – right from the start**

The paint distribution equipment is the beginning of the complete paint process and is a vital part of ABB's overall goal: to guarantee the finish quality of the painted part. These equipments are also suitable for wax, sealers and glues distribution.

To ensure this, the paint pressure, pipe diameters, paint flow, paint speed and temperature, have to be carefully checked and calculated and the right equipment selected and combined.

ABB's experienced process specialists have developed high quality and flexible automation equipment, paying attention to all these parameters - to increase the performance of the complete paint system.

ABB can supply complete ready-to-use facilities, parts of facilities or renovation of existing facilities.



1. Product distribution station

Paint distribution is one of the stages of the container course in the mixing room. ABB's fully automated product distribution station ensures dispatching of paint to the application points. Its design means that containers can be changed without interrupting production. Container presence sensors control station function and guarantee operator safety.

2. The paint distribution station

The paint distribution station is the basic feature of a distribution facility for products delivered in barrels. ABB's extremely compact stations allow distribution of a large number of colours within a limited area. Fixed or mobile, they can be installed in a mixing-room or next to the line. Their capacity varies from 10 to 500 litres and over this on request.

3. Paint circulating

Paint circulating is the link element between the distribution station and application take-off points. ABB's concept ensures paint circulation with perfect control of all parameters necessary to obtain the required spraying quality. From design to implementation, all elements are taken into account in order to enable the paint to circulate without any deterioration occurring and to facilitate cleaning of the facility.



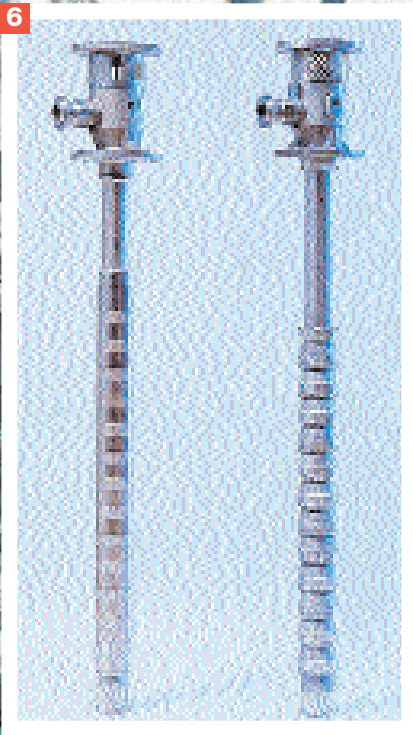
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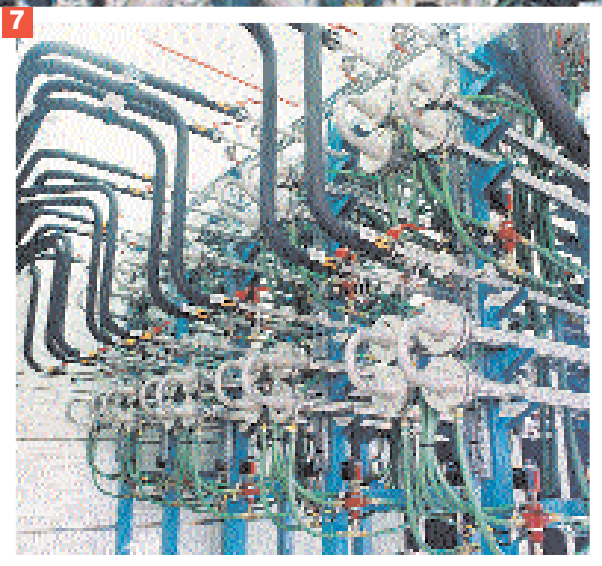
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6



7



Paint Kitchen

■ 4. High capacity paint distribution station

ABB's high capacity distribution station is fully automated and ensures paint dispatching to the application points. For this kind of station, the paint used may be conditioned in barrels or containers up to 1500 litres.

5. Pneumatic diaphragm pump

The pneumatic diaphragm pump is a key component in the paint distribution equipment. ABB's pneumatic diaphragm pump meets the facilities' quality and performance requirements. This pump is available in several versions, depending on the flow/pressure ratio and by the product to be conveyed.

6. QBT Turbine pump

The turbine pump is another key component in the paint distribution equipment. ABB's turbine pump enables almost all pressure and flow requirements of paint distribution facilities to be met. Noiseless and energetically self-sustaining, it offers real ease of use.

7. Process control

Process control is a key element in all modern mixing rooms. From high technology with full controls (temperature, mixing speed, weight, viscosity adjustment, levels, pressure) to reduced process control (fully low price pneumatic installation), ABB is able to meet customers' requirements and to adapt its system to reach the right technology level.

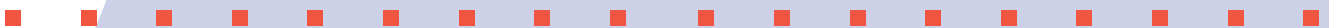


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