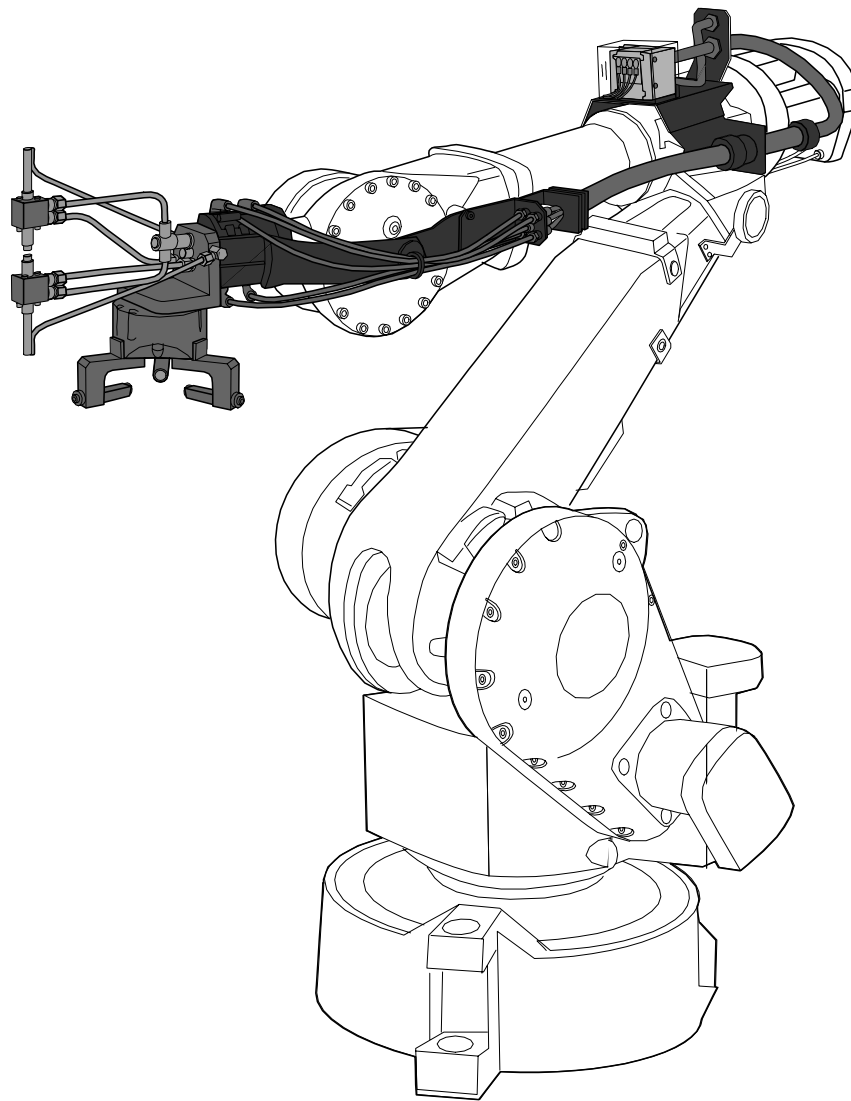


# Installation/Maintenance

## RobExtractSpray 2400/4400

3HXC 7211-1  
December 1999



The information in this document can be subject to change without prior notice and should not be regarded as an undertaking from ABB Flexible Automation AB. ABB Flexible Automation AB assumes no responsibility for errors that can appear in this document.

ABB Flexible Automation AB is not responsible for damage incurred by the use of this document or software or hardware described in this document.

The document, or parts there of, may not be reproduced or copied without prior permission from ABB Flexible Automation AB. It may neither be imparted to another nor otherwise used without authorisation. Infringement here of will be subjected to action in accordance with applicable laws.

Further copies of this document can be obtained from ABB Flexible Automation AB at current prices.

© ABB Flexible Automation AB

Article number: 3HXC 7211-1  
Issue: December 1999

ABB Flexible Automation AB  
System Products  
S-721 81 Västerås  
Sweden

## CONTENTS

	Page
<b>1 General</b> .....	<b>1</b>
<b>2 Safety</b> .....	<b>2</b>
<b>3 Installation</b> .....	<b>3</b>
3.1 Preparations before installing .....	3
3.2 Mounting of the adapter plate .....	4
3.3 Mounting of the swivel .....	5
3.4 Mounting of the grip unit .....	6
3.5 Mounting of the valve unit .....	8
3.6 Mounting of the swivel dog .....	9
3.7 Hose assembly .....	11
3.8 Connecting signals and compressed air .....	12
3.9 Connecting lubricating media .....	12
<b>4 Installation of robot and surrounding equipment</b> .....	<b>13</b>
<b>5 Tuning</b> .....	<b>14</b>
5.1 Spraying nozzles .....	14
5.2 Chuck spacers .....	15
<b>6 Maintenance</b> .....	<b>16</b>
6.1 Maintenance chart .....	16
<b>7 Pneumatic diagrams</b> .....	<b>17</b>
7.1 Valve unit VP2404/VP2406 .....	17
7.2 Valve unit VP2414 .....	17
7.3 Connections .....	18
<b>8 Circuit diagrams</b> .....	<b>19</b>
8.1 Connection unit 2400 .....	19
8.2 Connection unit 4400 .....	21
8.3 4400 .....	22
<b>9 Technical specifications</b> .....	<b>23</b>
9.1 RobExtractSpray for IRB 2400 and 2400L .....	23
9.2 RobExtractSpray for IRB 4400 .....	24
9.3 Valve unit .....	25
9.4 Hose and cabling .....	25
9.5 Media .....	26
9.6 Grip unit .....	26
9.7 Handling capacity .....	27
<b>10 Variants</b> .....	<b>29</b>
10.1 RobExtractSpray for IRB 2400 .....	29
10.2 RobExtractSpray for IRB 2400L .....	29

10.3 RobExtractSpray for IRB 4400..... 29

---

---

# 1 General

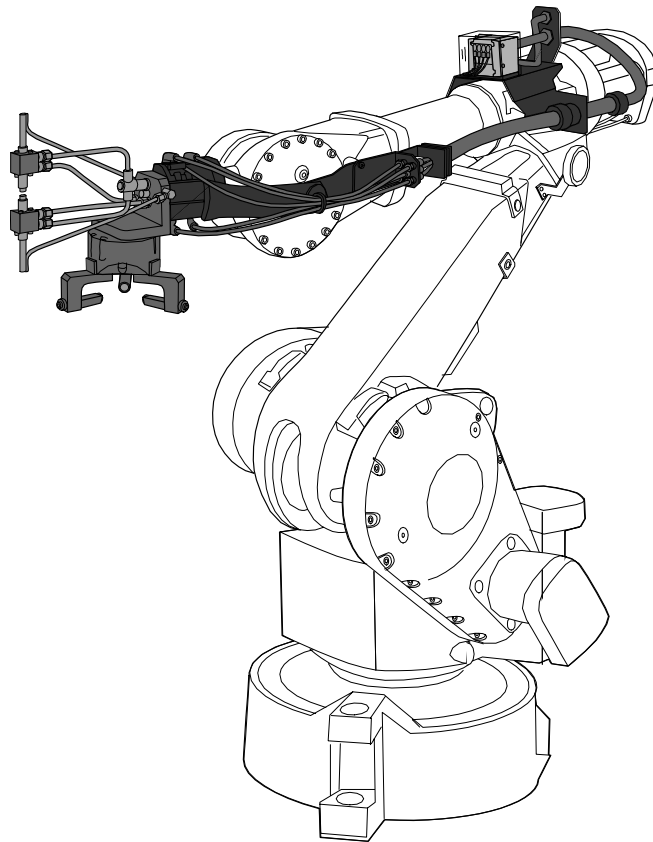
RobExtractSpray 2400 and 4400 are robot tool systems built to extract casted products from die-casting machines and to spray the mould with lubricant in order to lubricate and to cool it down. The system provides the tool with compressed air and lubrication fluid without limiting the agility of the robot.

RobExtractSpray tool system is developed for the IRB 2400, 2400L and 4400 robots. Due to the swivel and the spring loaded hose, it requires a minimum amount of maintenance. These parts also guarantees to keep full agility of the robot. The 3 finger gripper gives a good grip on the bisquit, and it is adaptive to conical bisquits.

The robots are described in separate documentation.

RobExtractSpray consists of:

- Valve unit
- Hose package with spring loaded hose
- Swivel
- 3 finger gripper
- Spraying nozzles



*Figure 1 RobExtractSpray mounted on a IRB 4400*

---

---

## 2 Safety

This safety information only applies to the die-casting tool system RobExtractSpray for IRB 2400, IRB 2400L and IRB 4400. For safety information about the robots, see each robots product and user manual.

Personnel installing RobExtractSpray must do so in accordance with the safety demands stated in standards and provisions applicable in the country where the RobExtractSpray is to be installed.

The user of the ABB operations package (tool system and robot), is responsible that laws and directives applicable in respective countries, with regard to safety, are followed, and that all safety devices necessary to guarantee the safety of those persons working with the operations package are installed correctly.

This document contains safety related information. This information is marked with WARNING! or NOTE!



**WARNING!**

**Risks that can result in personal injury.**

---

**NOTE!** Important facts and conditions that must be observed by the user.

---

---

## 3 Installation

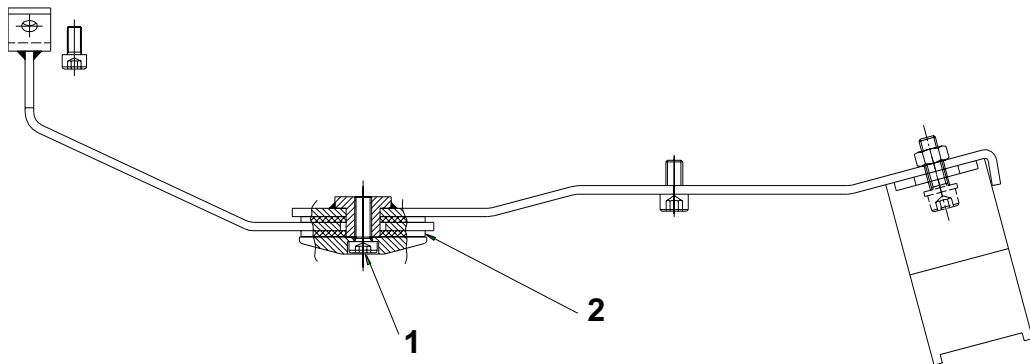
The following chapters describe how to mount the tool system RobExtractSpray on the robot in the recommended order of mounting.

---

### 3.1 Preparations before installing

Before mounting the RobExtractSpray on the robot, some preparations must be made.

1. Dismantle the jointed part of the swivel dog.
2. Lubricate the slide washer (2) with MAGNALUBE.
3. The bolt in the swivel dog (1) must be secured with LOCTITE 542, unscrew the screw and apply LOCTITE.
4. Assemble the swivel dog by putting the slide washer in position and tighten the screw (1).

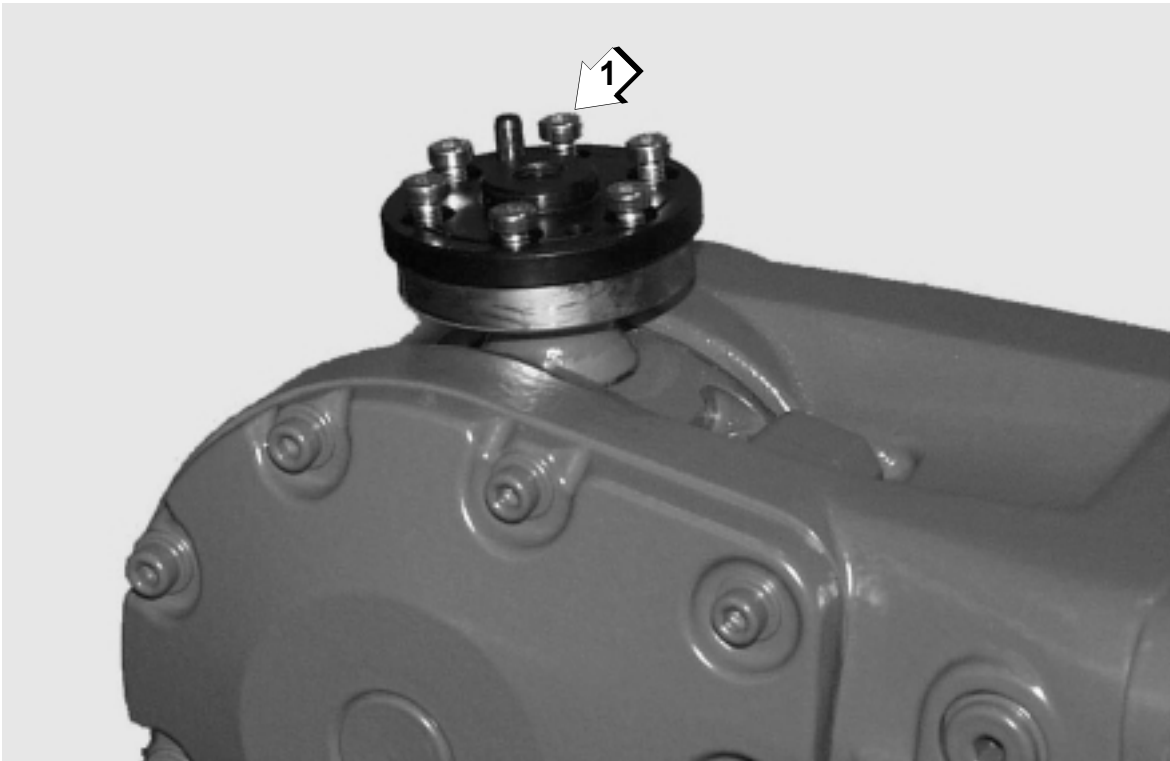


*Figure 2 Preparations before installing*

---

### 3.2 Mounting of the adapter plate

1. Mount the adapter plate on the robot's connecting flange, the guide pin on the adapter plate only fits one way.
2. Tighten the adapter plate to the connecting flange with the delivered bolts,  
1. Tighten the bolts crosswise.



*Figure 3 Mounting of the adapter plate*



---

### 3.3 Mounting of the swivel

1. Fit the swivel on the adapter plate with the guide pin, **1**.
2. Tighten the swivel with the centre lock bolt.

**NOTE!** The adapter plate must be firmly tightened to the connecting flange before the swivel is tightened.



*Figure 4 Mounting of the swivel*

---

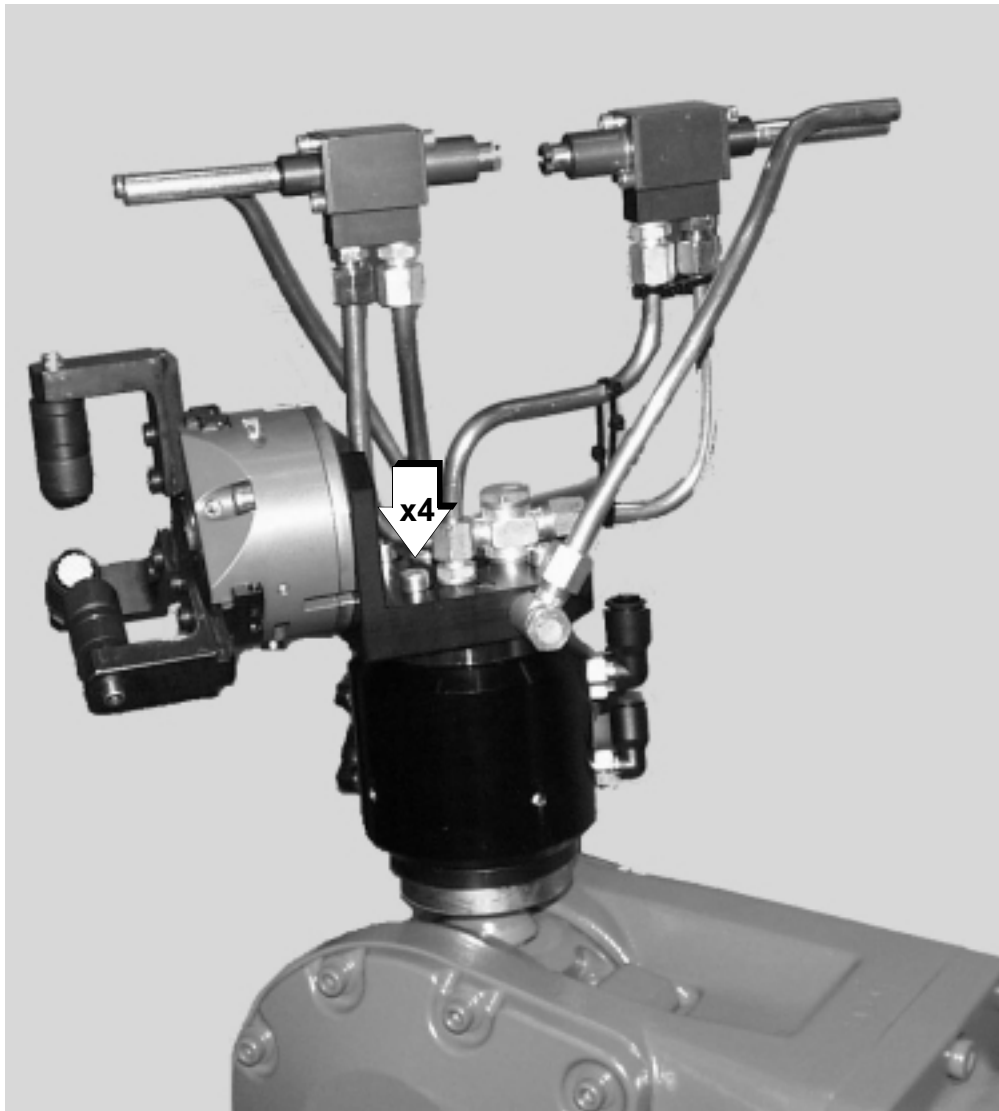
### 3.4 Mounting of the grip unit

1. Put the O-rings in the cut-outs by the holes for air and lubricating media.
2. Place the grip-unit on the swivel and fit the guide-pins on the angled attachment plate, make sure that the grip fingers do not block the connecting hoses.



*Figure 5 Mounting of the grip unit*

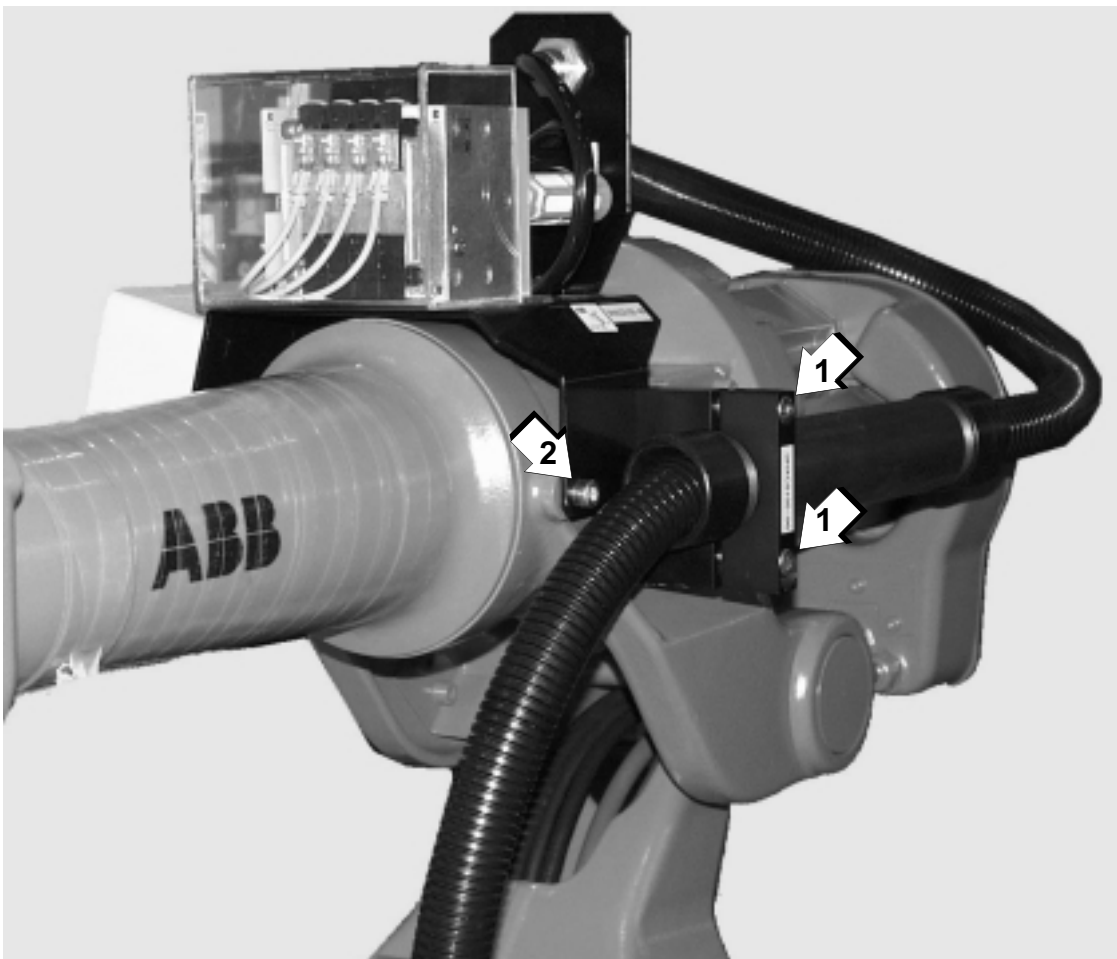
3. Tighten the grip unit to the swivel.



*Figure 6 Tighten the inset bolts on top of the angled attachment plate.*

### 3.5 Mounting of the valve unit

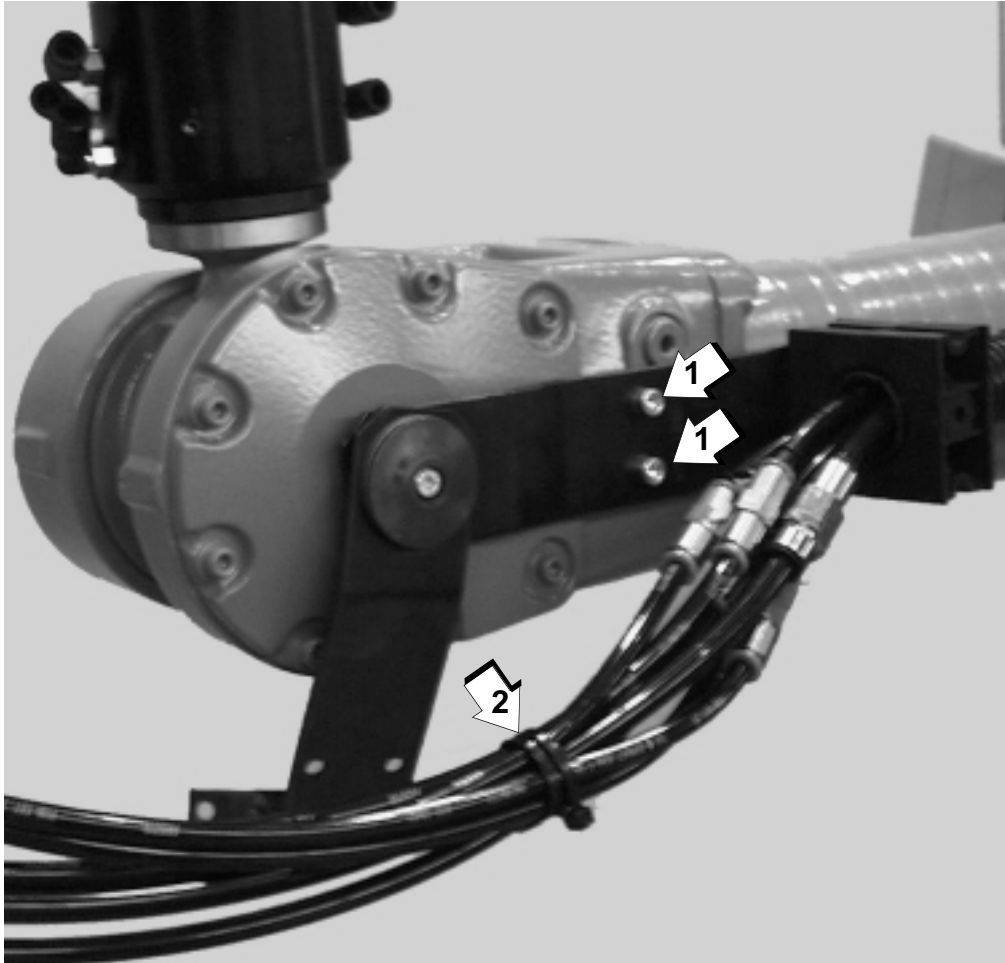
1. Put the valve unit on top of the robot's axis 4.
2. Tighten the spring loaded hose to axis 4 (1). Screw the bolts for the spring-loaded hose through the valve units's attachment.
3. Pull back the plastic tube, mounted around the spring loaded hose, so that the bolt in the valve unit's attachment is reachable and tighten the bolt (2).



*Figure 7 Mounting of the valve unit*

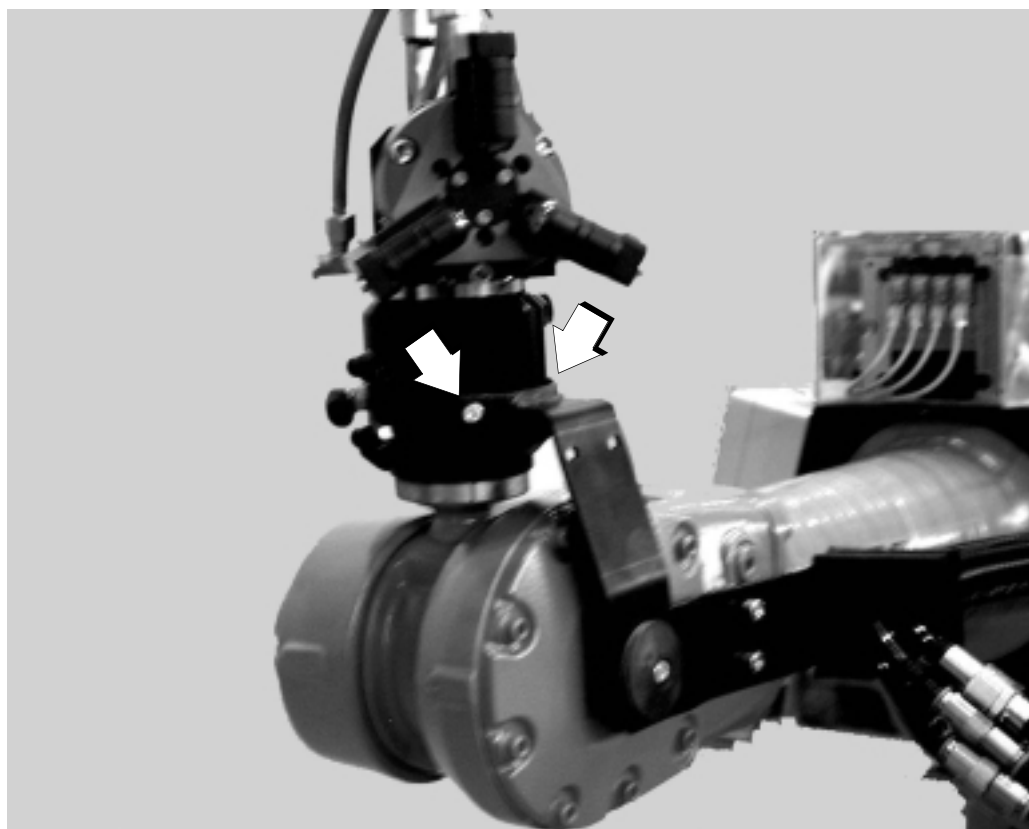
### 3.6 Mounting of the swivel dog

1. Attach the swivel dog on the robot (1), but do not tighten it.
2. Tie the cables together with a cable tie(2).



*Figure 8 Mounting of the swivel dog*

3. Tighten the swivel dog screws in the swivel and tighten thereafter the screws in the robot.

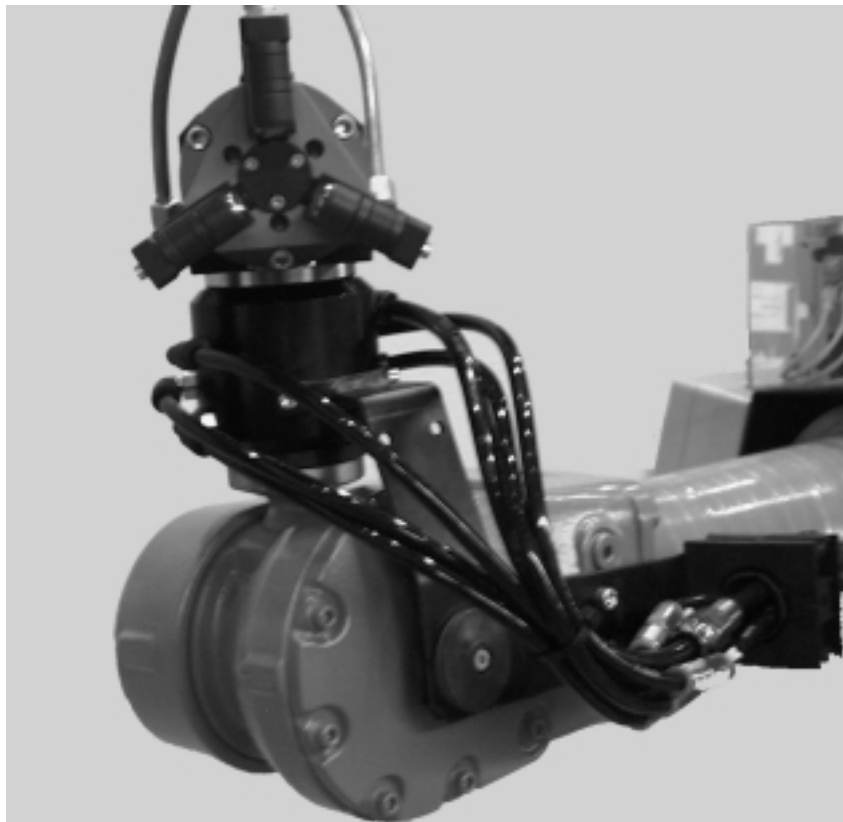


*Figure 9 Tighten the swivel dog on the swivel*

### 3.7 Hose assembly

1. Attach the hoses in the banjo fittings on the swivel. Make sure that you connect the hoses correctly. The cables and the connections on the swivel are labelled. Push the plastic ring and insert the hose to attach it.

Marked on the swivel housing	Hose
Channel 1	Air, marked 1
Channel 2	Air, marked 2
Channel 3	Air, marked 3
Channel 4	Air, marked 4
Channel 5	Air, marked 5
Channel 6	Lubrication fluid, marked 6

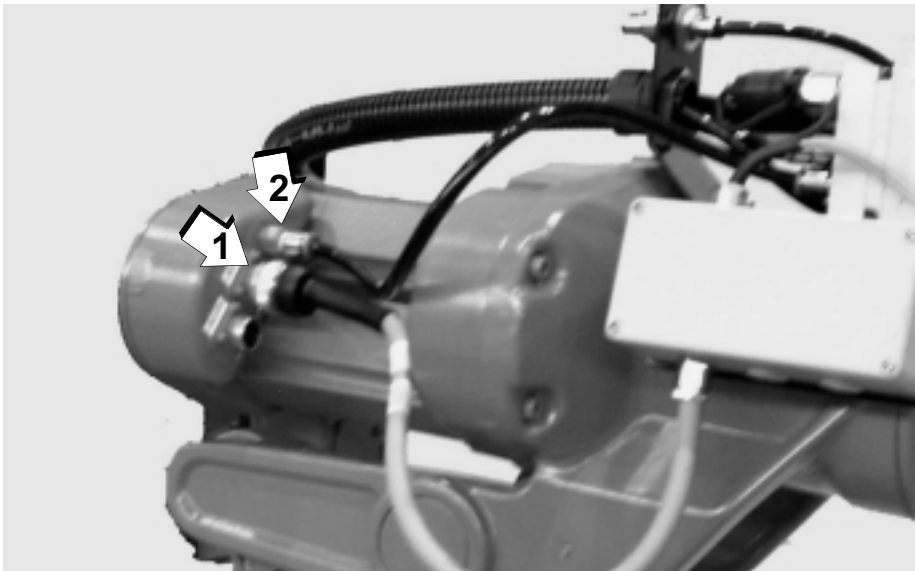


*Figure 10 Hose assembly.*

---

### 3.8 Connecting signals and compressed air

1. Connect the signal cable to the connection marked R2.CS on axis 4 (1).
2. Connect the compressed air hose to the connection on axis 4, push the banjo fitting and insert the hose to attach it.

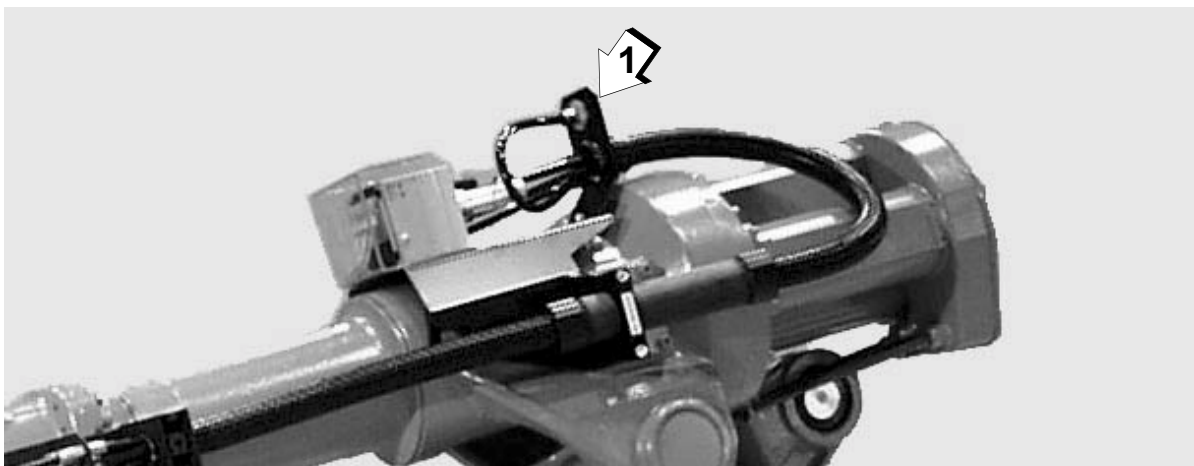


*Figure 11 Connecting power and compressed air*

---

### 3.9 Connecting lubricating media

1. Connect the hose with lubrication to the 3/8" connection at the hose package (1). The hose should be lead down from above in order keep the agility of the robot.



*Figure 12 Connecting lubrication media*



## 4 Installation of robot and surrounding equipment

This is an example of how a robot, equipped with RobExtractSpray, working at a die-casting machine.

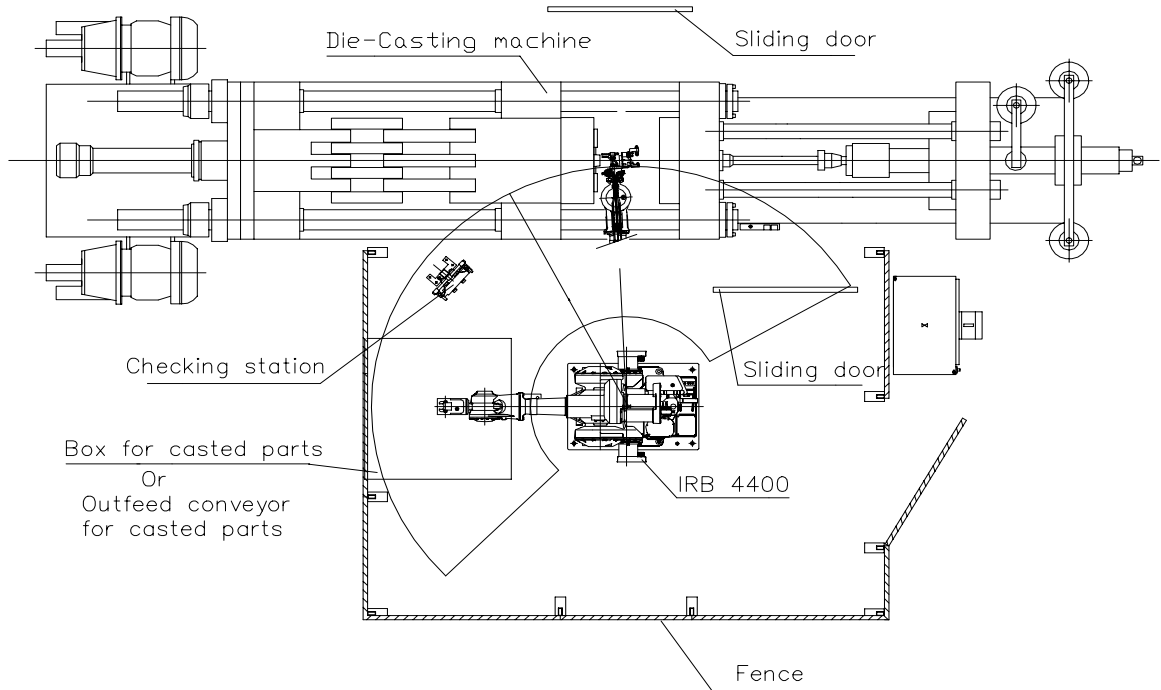


Figure 13 Die-casting machine with a robot using the RobExtractSpray tool system.

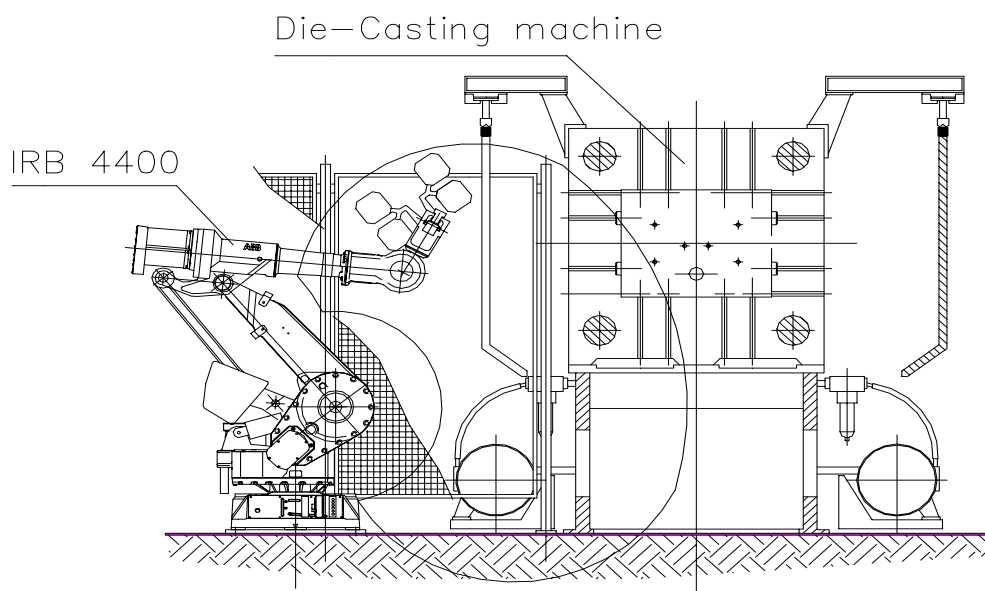


Figure 14 Die-casting machine with a robot using the RobExtractSpray tool system.

---

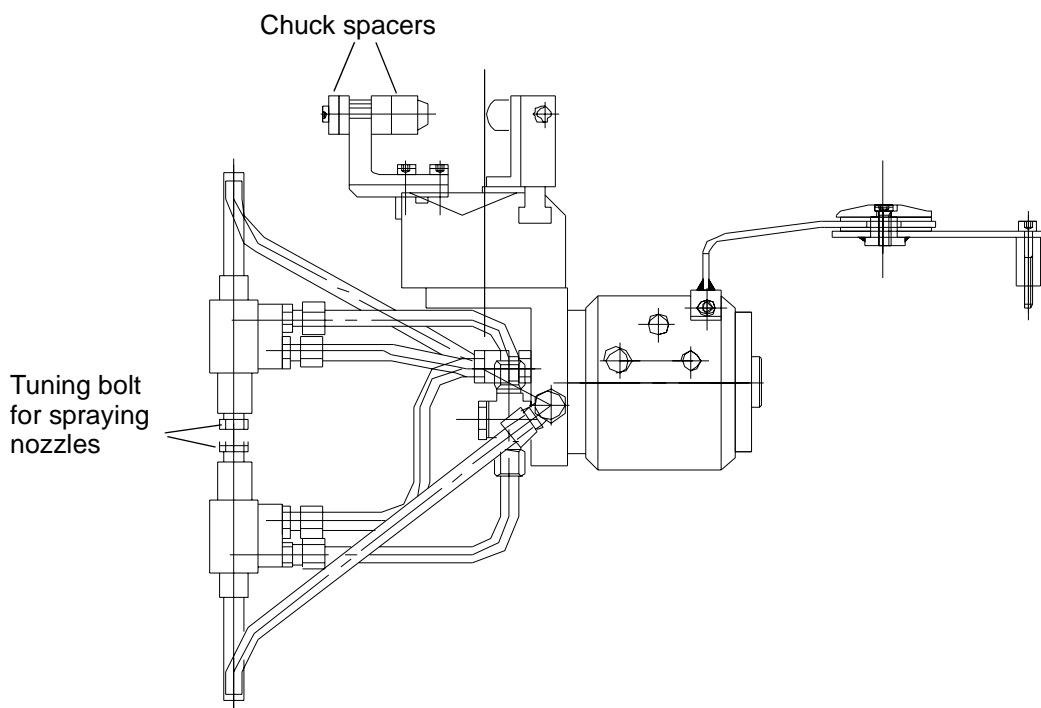
---

## 5 Tuning

---

### 5.1 Spraying nozzles

The bolts on the spraying nozzles are used to tune the size of the spraying douche sprayed on the mould.



*Figure 15 Chuck spacers and tuning bolt for spraying nozzles on grip unit.*

## 5.2 Chuck spacers

The spacers on the chuck's grip fingers, see Figure 15, can be moved in order to fit different sized bisquits, see Figure 16 and Figure 17.

Untighten the inset screws on grip finger and move the chuck spacers to change the gripping size.

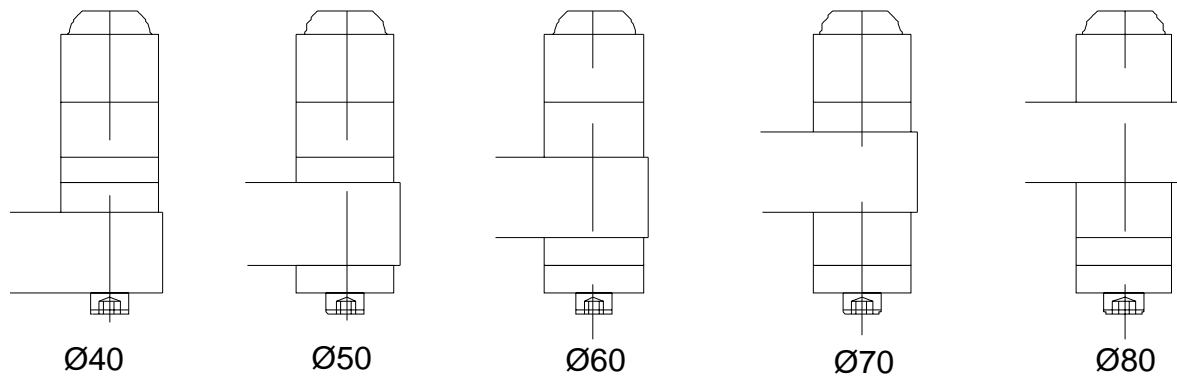


Figure 16 The spacers on the gripfingers can be moved in order to change the gripping diameter on the gripper, the figure above shows the gripping fingers on the RobExtractSpray for IRB 2400.

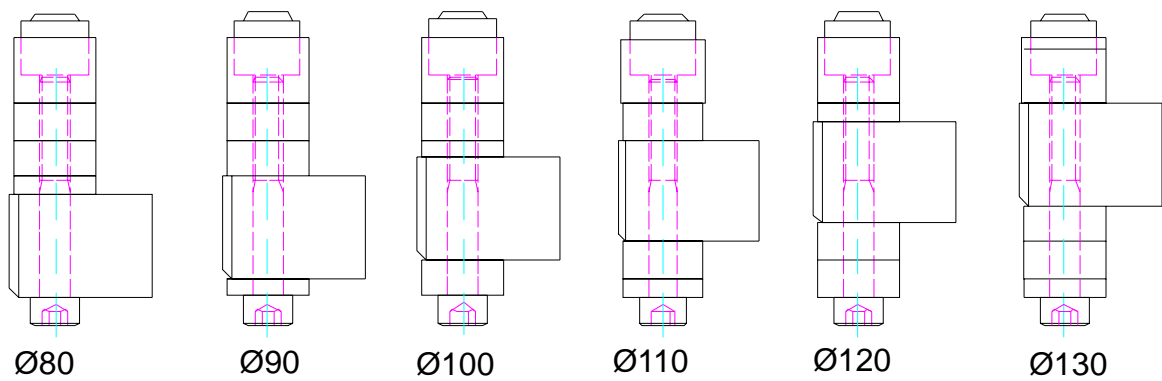


Figure 17 The spacers on the gripfingers can be moved in order to change the gripping diameter on the gripper, the figure above shows the gripping fingers on the RobExtractSpray for IRB 4400

---



---

## 6 Maintenance

---

### 6.1 Maintenance chart

The intervals stated below are approximate values for normal operating conditions. Treat the tables as a guide and update them as your production experience for each system grows.

**NOTE!** If the swivel must be dismantled during the warranty period, this must be performed by trained ABB-personnel. In other cases the warranty ceases to be valid.

Name	Maintenance	Interval	Remark
Hose and cable wear	Visual inspection	400 operating hours	From base to swivel
Swivel	Inspection for leakage	500 000 rev/axis 6	
Bearing swivel housing	Lubricate	1000 operating hours	MAGNALUBE-G

## 7 Pneumatic diagrams

### 7.1 Valve unit VP2404/VP2406

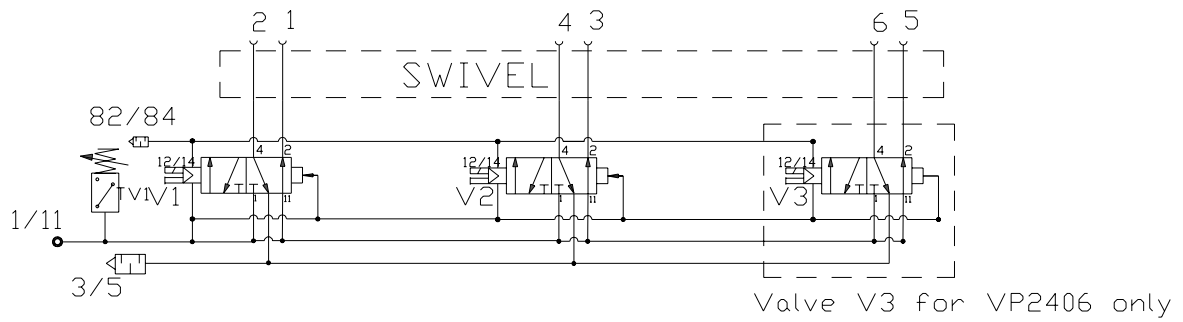


Figure 18 Art. No: 3HXC 1000-1

### 7.2 Valve unit VP2414

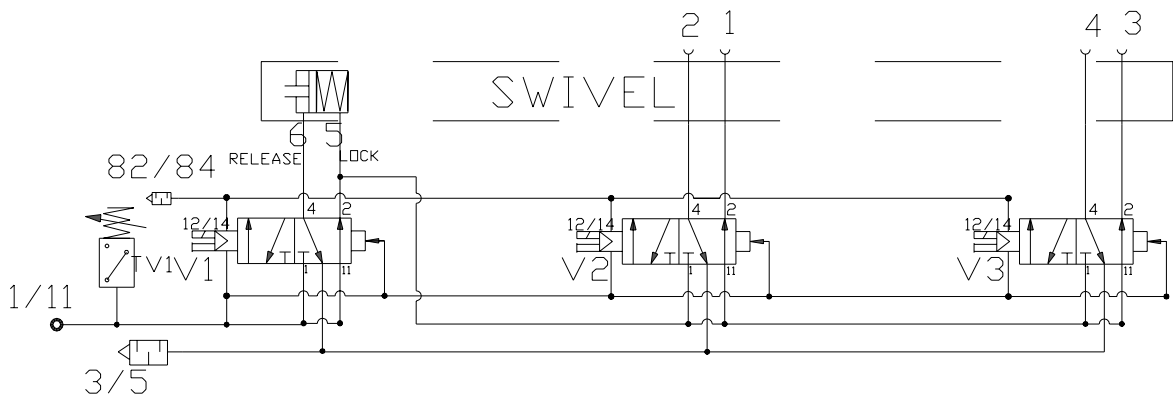


Figure 19 Art. No: 3HXC 1000-2

### 7.3 Connections

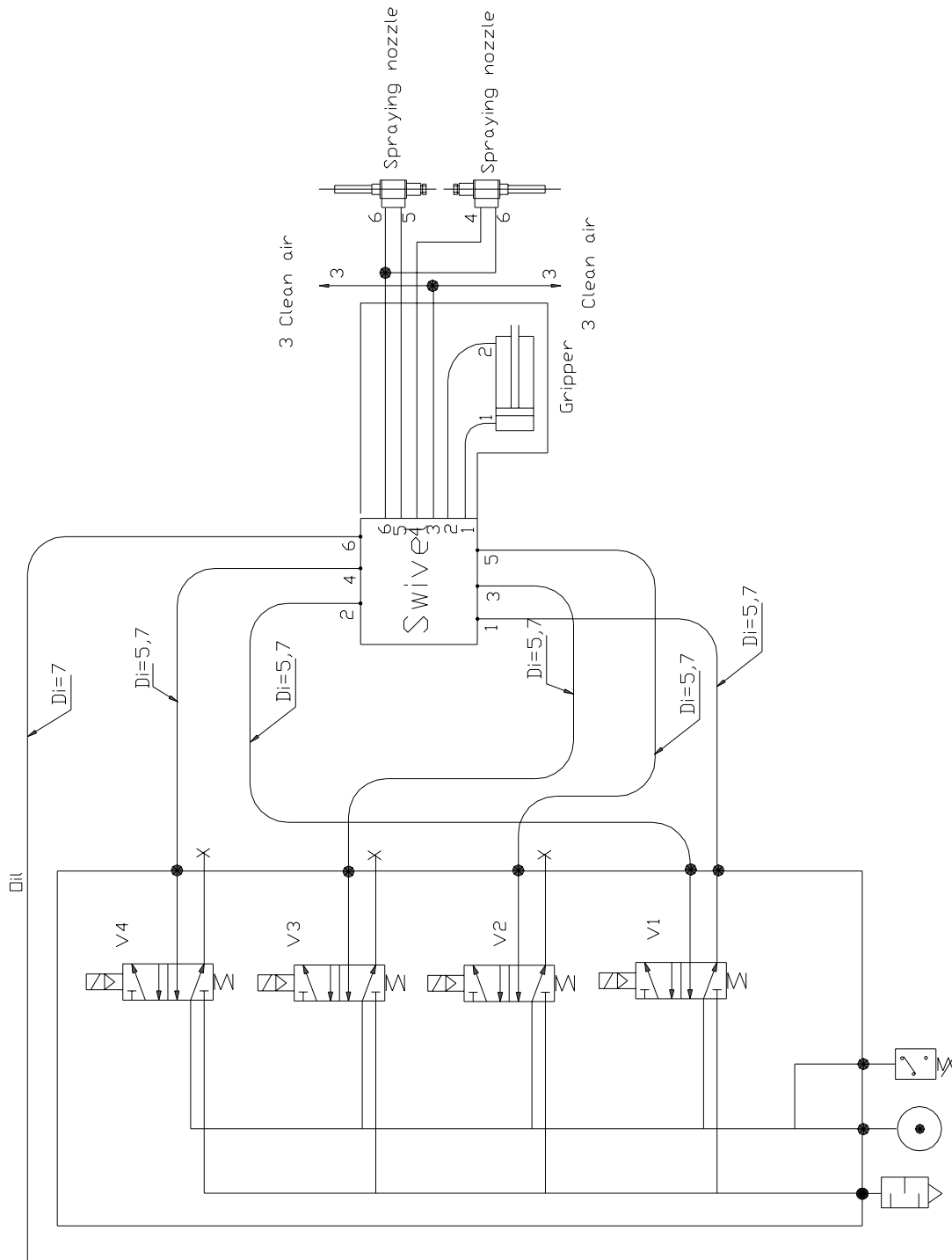


Figure 20 Art. no: 3HXC 1000-38

# 8 Circuit diagrams

## 8.1 Connection unit 2400

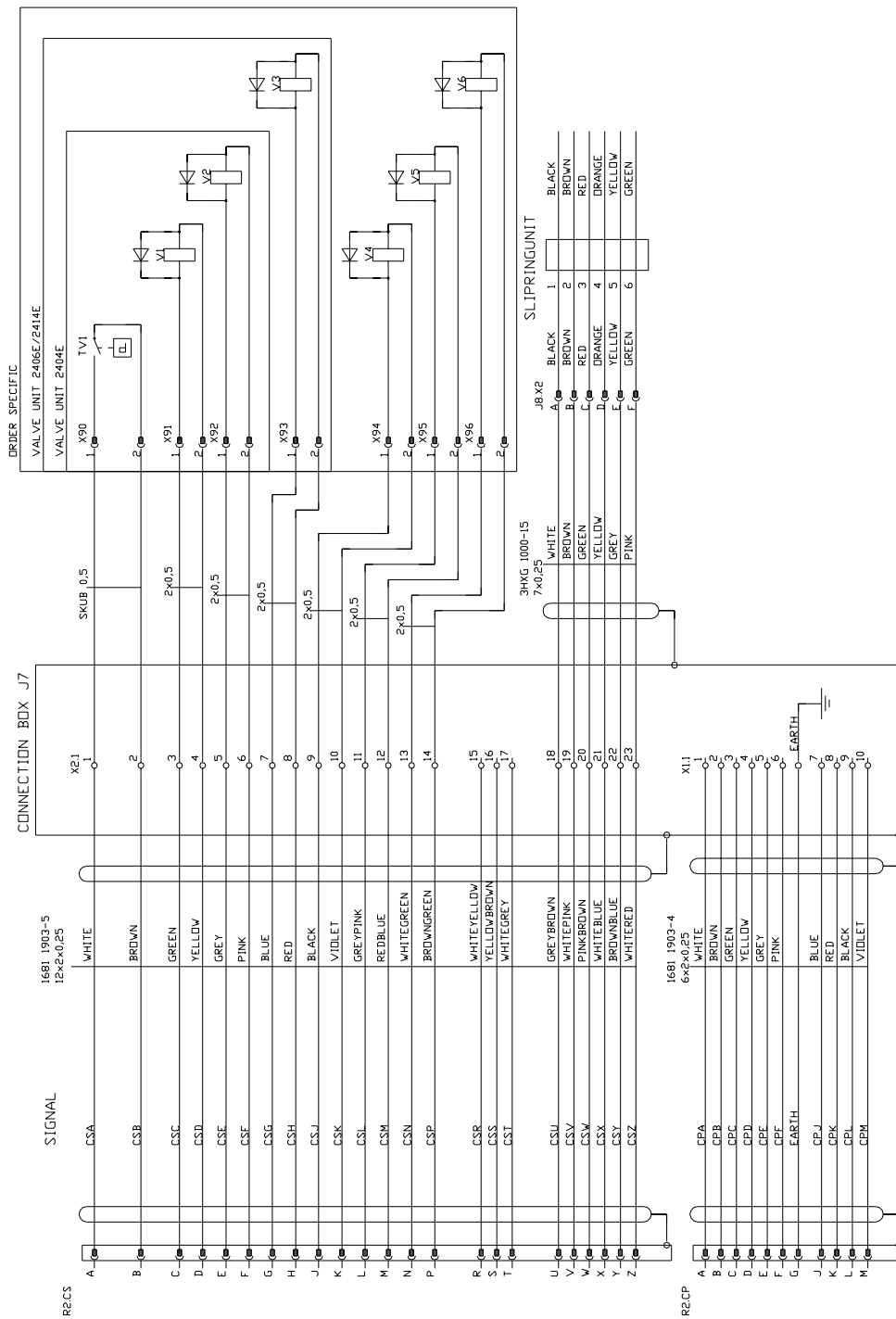


Figure 21 Art.No: 3HXC 8000-4, sheet 1

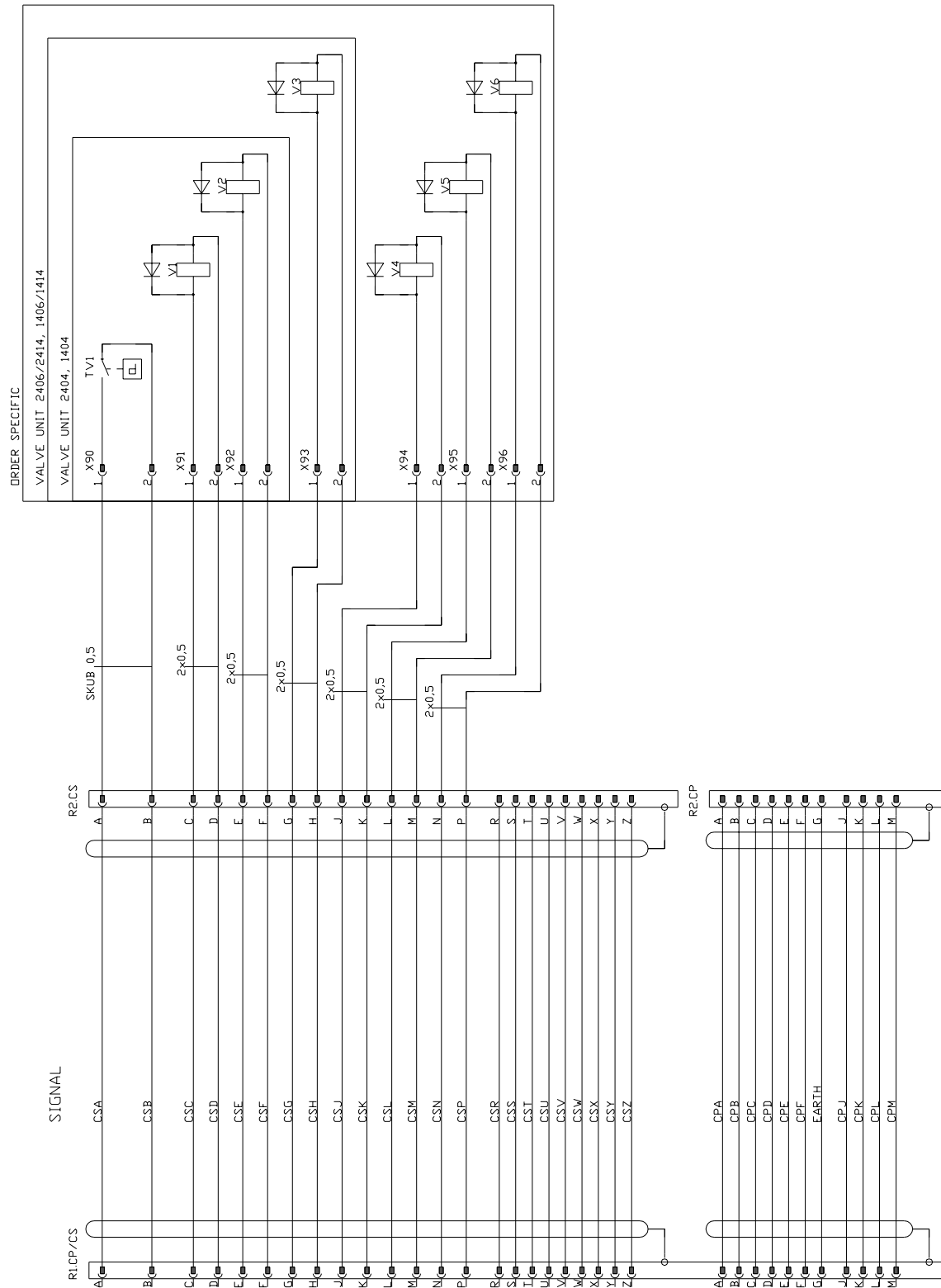


Figure 22 Art. No: 3HXC 8000-4, sheet 2



## 8.2 Connection unit 4400

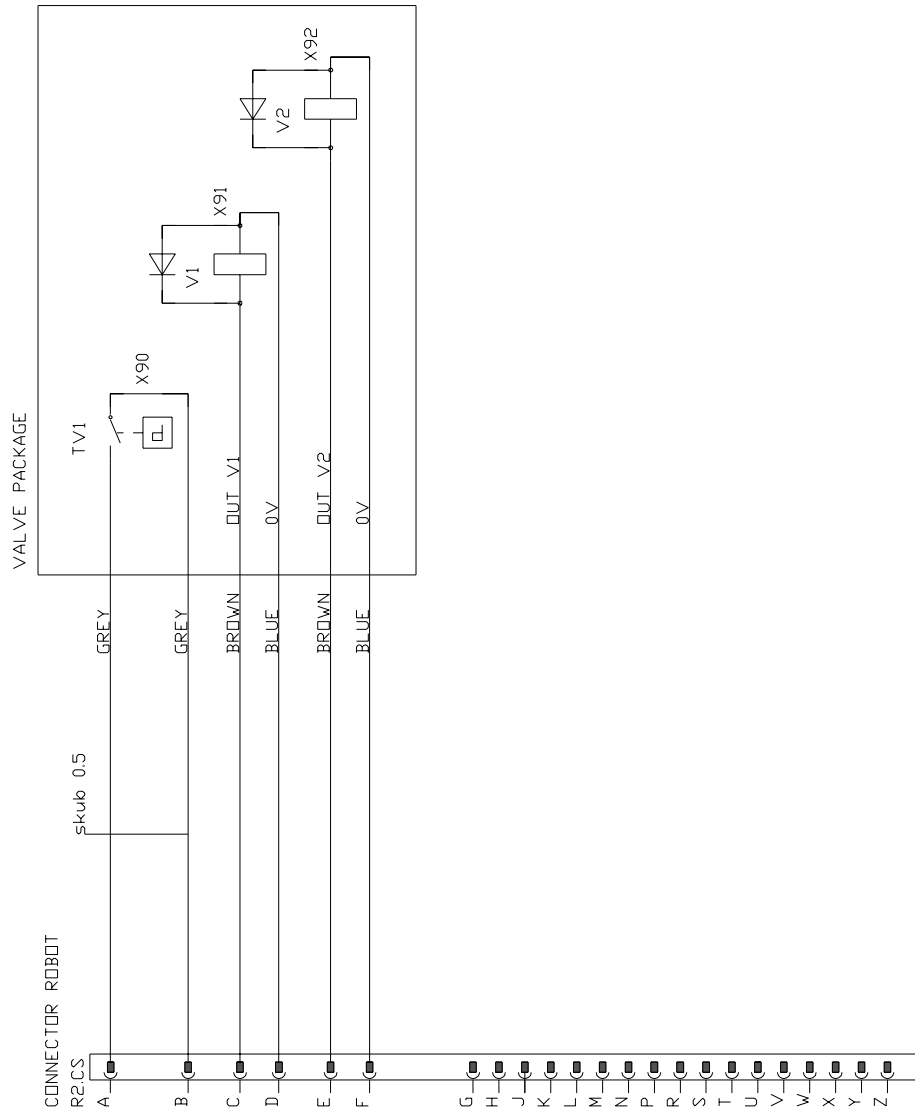


Figure 23 Art. No: 3HXC 8000-10, sheet 1

8.3 4400

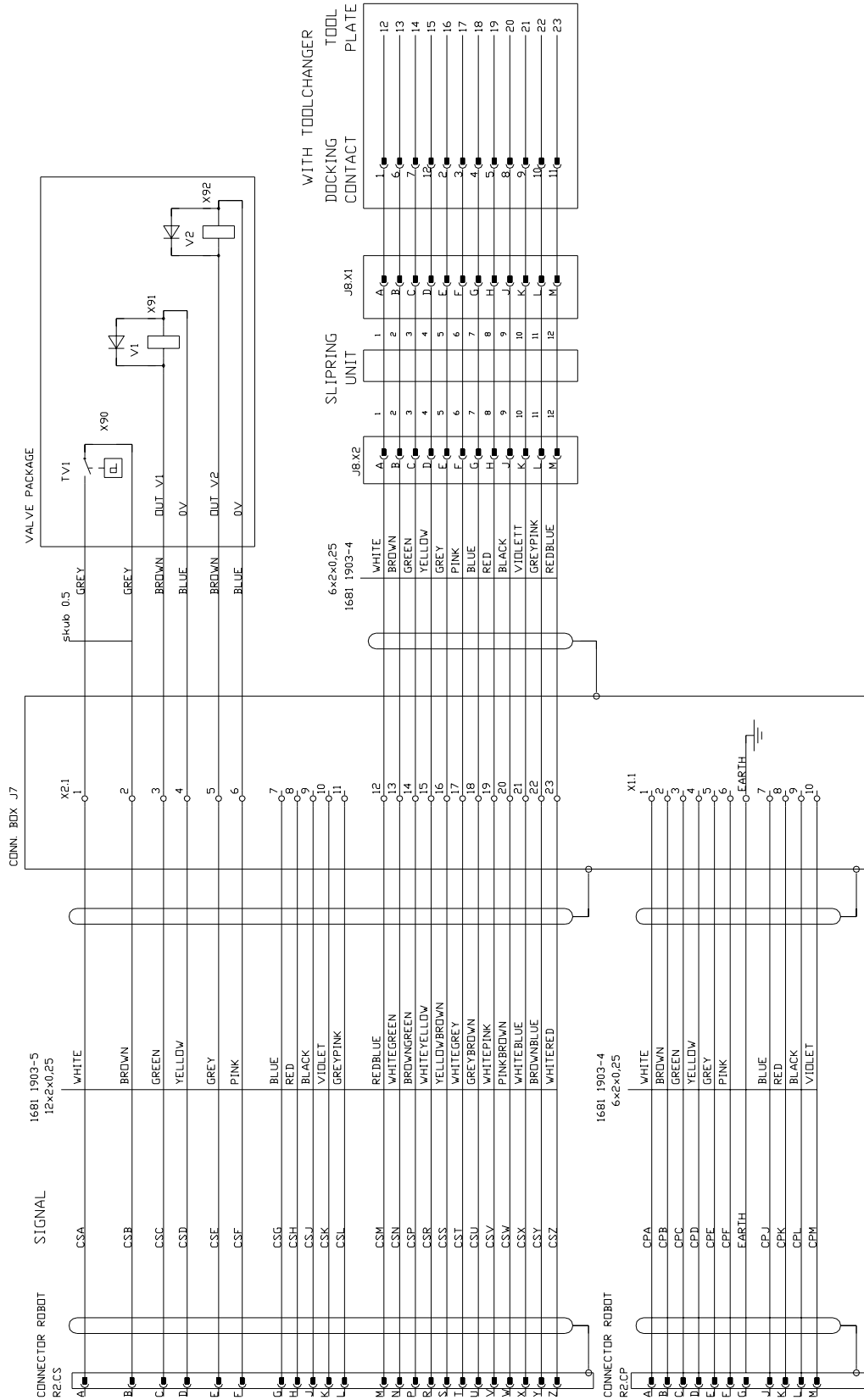


Figure 24 Art. No: 3HXC 800-10, sheet 2

## 9 Technical specifications

### 9.1 RobExtractSpray for IRB 2400 and 2400L

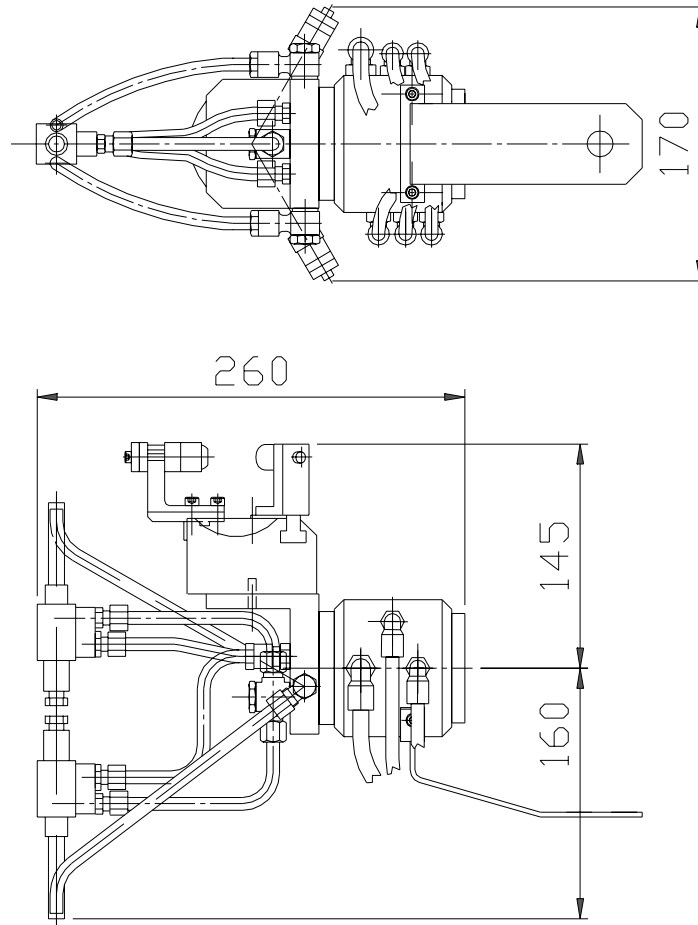


Figure 25 RobExtractSpray for IRB 2400 and 2400L

<b>Length without swivel</b>	170 mm
<b>Length with swivel</b>	260 mm
<b>Height</b>	170 mm
<b>Width</b>	305 mm
<b>Weight</b>	5.2 kg

## 9.2 RobExtractSpray for IRB 4400

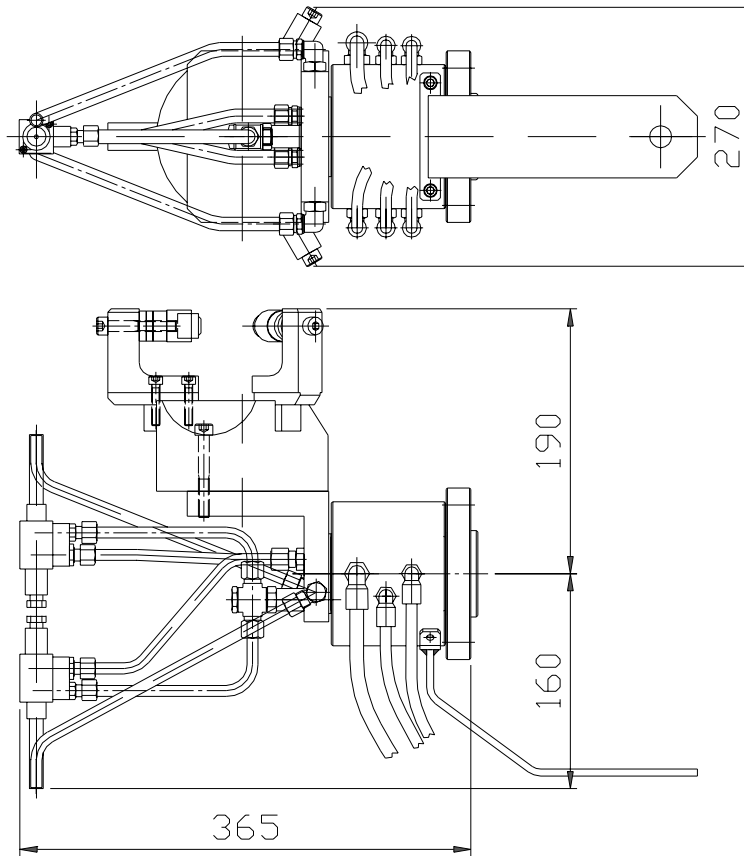


Figure 26 RobExtractSpray for IRB 4400

<b>Length without swivel</b>	365 mm
<b>Length with swivel</b>	470 mm
<b>Height</b>	270 mm
<b>Width</b>	335 mm
<b>Weight</b>	12.1 kg

---

### 9.3 Valve unit

#### Valves

Valve type:	Festo CPV-14-V1
Number of valves:	4
Solenoid:	24 V DC, 0,75W
Typ:	Monostabile
Flow rate:	800 l/min
Protection class:	IP 65
Pressure limitation:	1-10 bar

#### Connection box

Number of insert connection block:	23
Dimensions (l x b x h):	160 x 80 x 57mm
Protection class:	IP 54

#### Conection to the robots application interface

Connection to upper arm cabling R2.CS with Burndy connectors.

---

### 9.4 Hose and cabling

#### Compressed air hose

Cross section area, duct:	23,7 mm <sup>2</sup>
---------------------------	----------------------

#### Lubrication fluid hose

Cross section area, duct:	38 mm <sup>2</sup>
---------------------------	--------------------

#### Protective hose

Outer diameter:	345 mm
-----------------	--------

**Signal cable**

Cross section area:	12 x 2 x 0,25mm <sup>2</sup>
Connector:	Burndy

**9.5 Media**

**Compressed air**

Air quality:	Oil- and waterfree filtered air, max 25µm
Air pressure:	6 bar

**Lubrication**

Lubrication pressure:	6 bar
-----------------------	-------

**9.6 Grip unit**

**Swivel**

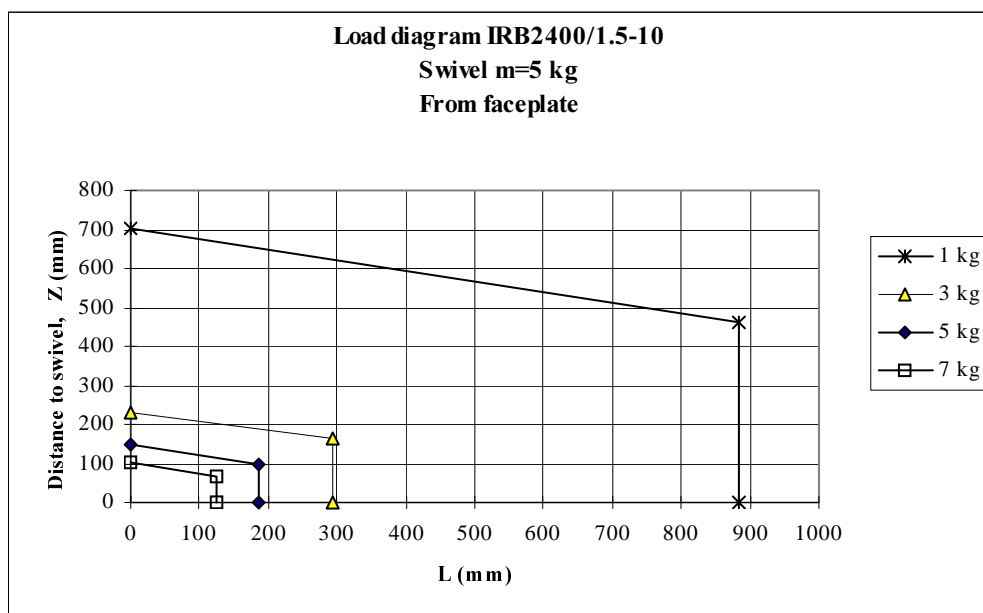
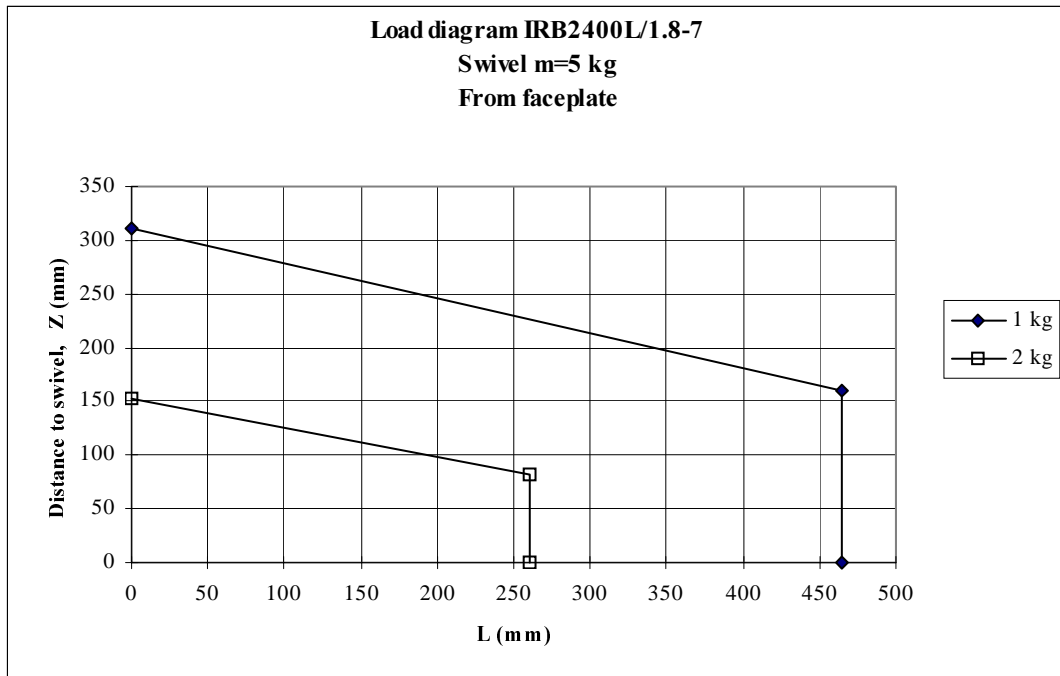
Number of channels:	6
Swivel axle:	Steel with a coating of nickel-phosphor alloy
Swivel housing:	Black aluminated aluminum

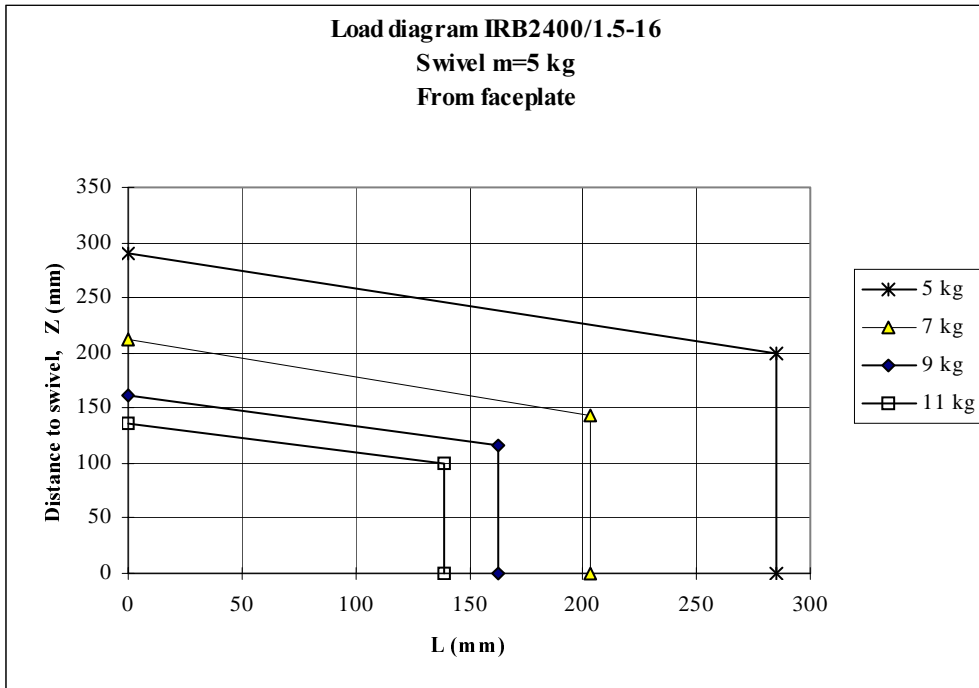
**Gripper**

For IRB 2400:	Schunk PZN 80-1/S
For IRB 4400:	Schunk PZN 125-1/S

### 9.7 Handling capacity

The gripper Schunk PZN 80-1/S, used on RobExtractSpray for IRB 2400, can handle products of a weight up to 5.3 kg. For more detailed information about how much the robot IRB 2400 can handle, see load diagrams below. The gripper Schunk PZN 125-1/S, used on RobExtractSpray for IRB 2400, can handle products of a weight up to 15.5 kg







---

---

## 10 Variants

---

### 10.1 RobExtractSpray for IRB 2400

3HXC 0000-44

Valve unit, spring loaded hose, swivel and grip unit.

---

### 10.2 RobExtractSpray for IRB 2400L

3HXC 0000-89

Valve unit, spring loaded hose, swivel and grip unit.

---

### 10.3 RobExtractSpray for IRB 4400

3HXC 0000-92

Valve unit, spring loaded hose, swivel and grip unit.





