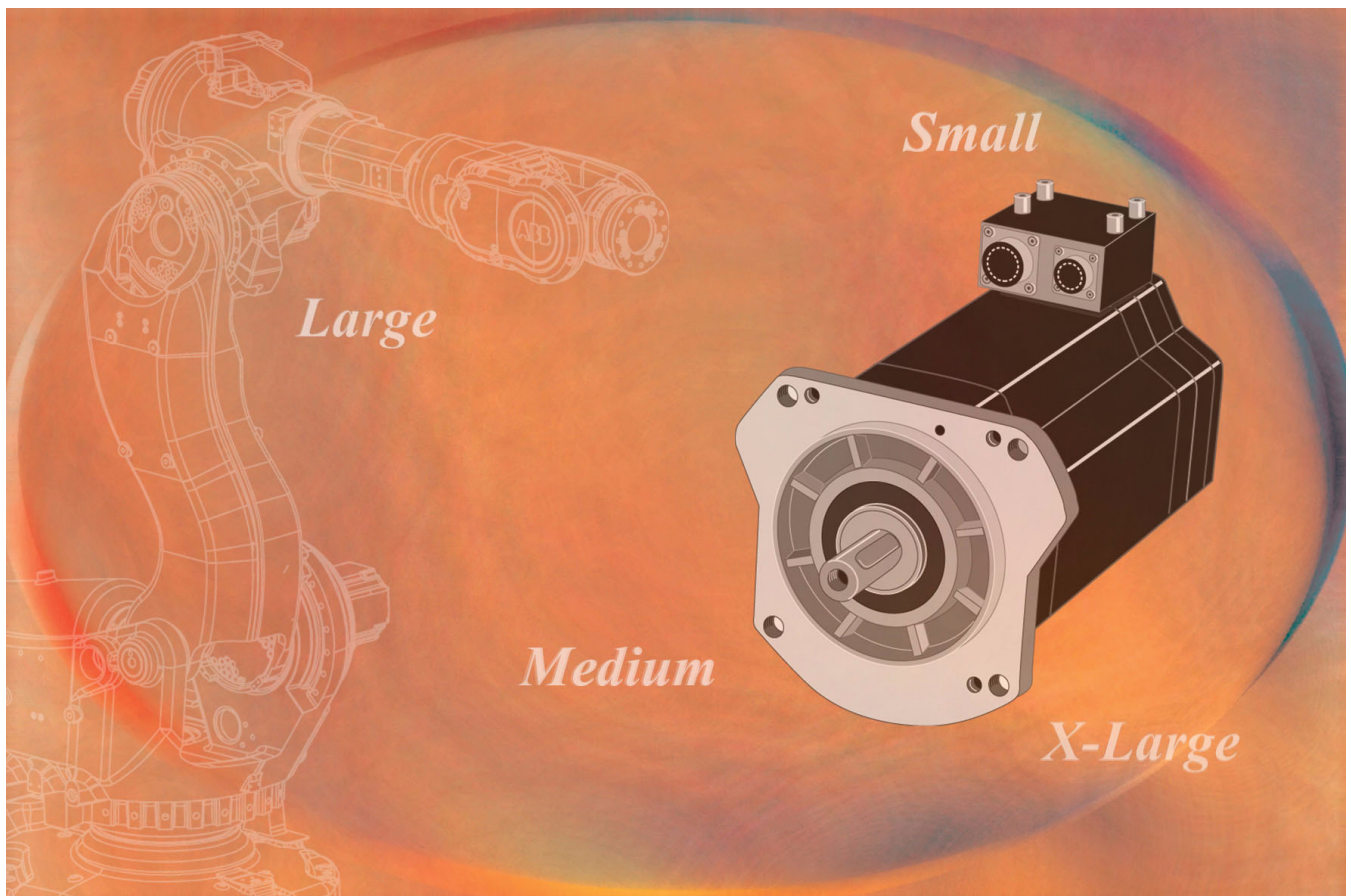


# Product Specification

## Motor unit

**Small, Medium, Large, X-Large**

3HXD 7110-1 Rev. 4 June 2003



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ABB Automation Technology Products AB  
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<b>1 Introduction</b>	<b>1 - 1</b>
1.1 General	1-1
1.1.1 Areas of application	1-1
1.1.2 Motor sizes	1-1
1.2 Description	1-2
1.2.1 General	1-2
1.2.2 Serial Measurement Box	1-2
1.3 Brakes	1-3
1.3.1 General	1-3
1.3.2 Releasing the brakes	1-3
<b>2 Technical specification</b>	<b>2 - 1</b>
<b>A Low voltage motors, for IRB 1400, 2400, 4400 and 6400R</b>	<b>2 - 1</b>
2.1 Motor small	2-1
2.1.1 Illustration	2-1
2.1.2 Technical data motor	2-1
2.1.3 Brake	2-2
2.1.4 Dimensional diagrams	2-2
2.1.5 Wiring diagram	2-3
2.1.6 Torque curve	2-3
2.2 Motor Medium	2-4
2.2.1 Illustration	2-4
2.2.2 Technical data motor	2-4
2.2.3 Brake	2-5
2.2.4 Dimensional diagrams	2-5
2.2.5 Wiring diagram	2-6
2.2.6 Torque curve	2-6
2.2.7 Gearbox for Motor Medium	2-8
2.3 Motor Large	2-9
2.3.1 Illustration	2-9
2.3.2 Technical data motor	2-9
2.3.3 Brake	2-10
2.3.4 Dimensional diagrams	2-10
2.3.5 Wiring diagram	2-11
2.3.6 Torque curve	2-11
2.3.7 Torque curve Motor Large+Medium	2-12
2.3.8 Torque curve Motor Large+Large	2-13
2.3.9 Gearboxes for Motor Large	2-13
2.4 Motor X-Large	2-15
2.4.1 Illustration	2-15
2.4.2 Technical data motor	2-15
2.4.3 Brake	2-16
2.4.4 Dimensional diagrams	2-16
2.4.5 Wiring diagram	2-17

---

2.4.6 Torque curves	2-17
<b>B High voltage motors, for IRB 6600/7600</b>	<b>2 - 18</b>
2.5 Motor Medium	2-18
2.5.1 Illustration	2-18
2.5.2 Technical data motor	2-18
2.5.3 Brake	2-19
2.5.4 Dimensional diagrams	2-19
2.5.5 Wiring diagram	2-19
2.5.6 Torque curves	2-20
2.6 Motor Large	2-21
2.6.1 Illustration	2-21
2.6.2 Technical data motor	2-21
2.6.3 Brake	2-22
2.6.4 Dimensional diagrams	2-22
2.6.5 Wiring diagram	2-23
2.6.6 Torque curves	2-23
2.6.7 Gearboxes for Motor Large	2-24
<b>C Serial measurement boxes</b>	<b>2 - 25</b>
2.7 Low voltage	2-25
2.7.1 One motor	2-25
2.7.2 Two motors	2-26
2.7.3 Four motors	2-27
2.7.4 Six motors	2-28
2.8 High voltage	2-29
2.8.1 One motor	2-29
2.8.2 Two motors	2-30
<b>D Brake release box (BRB)</b>	<b>2 - 31</b>
2.9 High voltage motor	2-31
<b>3 Electrical installation</b>	<b>3 - 1</b>
<hr/>	
<b>E One external axis</b>	<b>3 - 1</b>
3.1 General	3-1
3.2 Low voltage motors	3-1
3.2.1 Installation into one cabinet for 1400, 2400, 4400, 6400R	3-1
3.3 High voltage motors	3-3
3.3.1 Installation into one cabinet for IRB 6600/7600 with serial measurement box	3-3
3.3.2 Installation into one cabinet for 6600/7600 with brake release box	3-4

<b>F Several external axes</b>	<b>3 - 6</b>
3.4 Introduction	3-6
3.4.1 General	3-6
3.4.2 Operation	3-6
3.4.3 Limitation 1:	3-6
3.4.4 Limitation 2:	3-6
3.5 Low voltage motors	3-7
3.5.1 Installation into one cabinet for 1400, 2400, 4400, 6400R	3-7
3.6 High voltage motors	3-9
3.6.1 Installation into one cabinet for IRB 6600/7600	3-9
<b>4 Order information</b>	<b>4 - 1</b>
4.1 Introduction	4-1
4.1.1 General	4-1
4.1.2 Ordering cables	4-1
<b>G Motor unit (low voltage)</b>	<b>4 - 1</b>
4.2 One motor	4-1
4.2.1 Motors and gearboxes	4-1
4.2.2 Serial Measurement Box (SMB)	4-2
4.2.3 Cables between the SMB and motor	4-2
4.2.4 Cable for external axis from the robot cabinet to SMB	4-2
4.2.5 Cable for external axis from SMB to robot	4-2
4.3 Two to six motors	4-3
4.3.1 Motors and gearboxes	4-3
4.3.2 Serial measurement boxes (SMB)	4-3
4.3.3 Cables (SMB-motor)	4-3
4.3.4 Cables for external axes and several motors (cabinet-SMB)	4-4
4.3.5 Robot cabinet cable for MS2	4-4
<b>H Motor unit (high voltage)</b>	<b>4 - 4</b>
4.4 One or two motors	4-4
4.4.1 Motors and gearboxes	4-4
4.4.2 Serial Measurement Box (SMB)	4-5
4.4.3 Brake release box (BRB) for one motor	4-5
4.4.4 Cable between SMB and motor	4-5
4.4.5 Cable between DDU cabinet and BRB/SMB for one motor	4-5
4.4.6 Cable between DDU cabinet and SMB for two motors	4-6
4.4.7 Cable between robot cabinet and SMB for one or two motors	4-6
4.4.8 Cable between robot and BRB	4-6
4.5 Notes:	4-7



# 1 Introduction

## 1.1 General

This description provides a summary of the motor units' characteristics and performance.

---

### 1.1.1 Areas of application

The module-based motor units are specially designed for ABB's robots. The motor units can be used for peripherals requiring power-steered motors that are synchronised with the robot movements.

The motor units are designed for optimal performance and to facilitate installation and application.

---

### 1.1.2 Motor sizes

#### Low voltage

The motor units are available in the following sizes:

- Small, 1.7 Nm, 4500 r/min
- Medium, 5.0 Nm, 4500 r/min
- Large, 12.0 Nm, 3083 r/min
- X-Large 23.0 Nm, 3400 r/min

Medium and Large motor units can be ordered either with or without a gearbox.

---

#### High voltage

The motor units are available in the following sizes:

- Medium, 6.5 Nm, 2500 r/min
- Large, 21.7 Nm, 1771 r/min

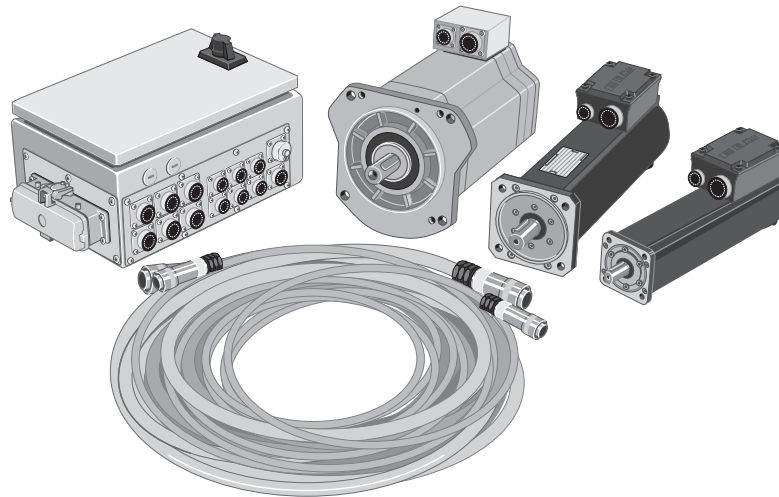
## 1.2 Description

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### 1.2.1 General

The motor units are power-operated and function as external axes. The motors are controlled by drive units mounted either in the robot's switch box or in a separate housing.

- A motor can be linked to the robot system as an integrated external axis.
- An integrated external axis can move synchronously with the robot axes.
- A complete motor unit comprises a serial measurement box, motors, parameter diskette and a number of standardised cables.



---

### 1.2.2 Serial Measurement Box

The serial measurement box contains a serial measurement card (with battery backup) and push-buttons for releasing the brakes. The serial measurement box can, if required, be located up to a recommended maximum of 15 m from the motor.

---



**If high voltage motors, material handlers (MH), one external axis and option 2204 or 2200 are selected, the serial measurement box can be replaced by a brake release box.**



## 1.3 Brakes

### 1.3.1 General

All motors described in this manual are equipped with electromagnetic brakes. Brakes are on when they are not energised. They can be released in several different ways, and are described in the following section.

### 1.3.2 Releasing the brakes

The various methods for releasing the brakes manually are specified in the table below.

When	Notes
When the brake release/serial measurement box is connected to the Robot Control Cabinet.	The brake will be released when the button in the box is pressed.
24VDC/1A supply unit is connected between MP.JB1 output c5 (0V) and c4(+24VDC) in the brake release/serial measurement box.	The brake will be released when the button in the box is pressed <sup>a</sup> .
24V is connected, for two external axes, between MP.JB1 output a5 (0V) and a4 (+24V DC)	The brake for axis 7 will be released when button 7 in the box is pressed.

- a. For two external axes, the brake is released for axis 8 when button 8 is pressed, see [Brake release box \(BRB\) section D](#)



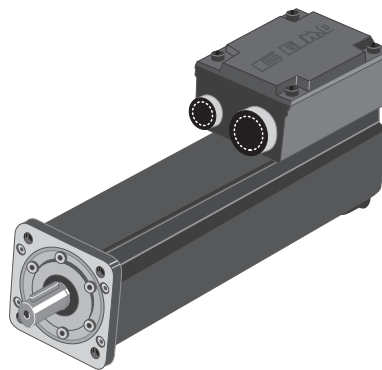
## 2 Technical specification

### A Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

#### 2.1 Motor small

##### 2.1.1 Illustration

The illustration below shows a “Motor small”.



Motor small

##### 2.1.2 Technical data motor

Parameters	Values
Suitable drive unit	G
Nominal rotation speed ( $N_{nom}$ )	4500 r/min (recommended max. rotation speed 3300 r/min)
Nominal torque ( $T_N$ )	1.7 Nm
Max. dynamic torque	5.7 Nm
Max. current ( $I_{max.}$ )	19 A (3.8 x 5)
Current at torque $T_N$ ( $I_{RMS}$ )	3.8 A
Torque constant ( $K_T$ )	0.45 Nm/A
Winding resistance/phase (R)	3.80 ohm
Mass torque incl. brake (J)	0.00013 kgm <sup>2</sup>
Number of pairs of poles	2
Winding inductance/phase (L)	7.0 mH
Weight (M)	4.4 kg
Temperature range	+5° - +45°C

## Technical specification

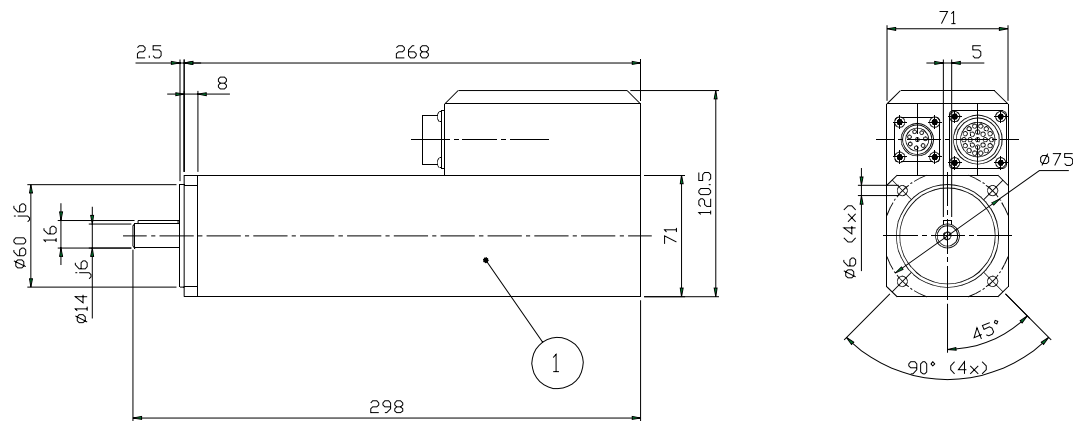
Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

Parameters	Values
Voltage constant, main voltage, ( $K_E(U_{RMS})/1000$ r/min)	27.0 V
Nominal output	0.7 KW

### 2.1.3 Brake

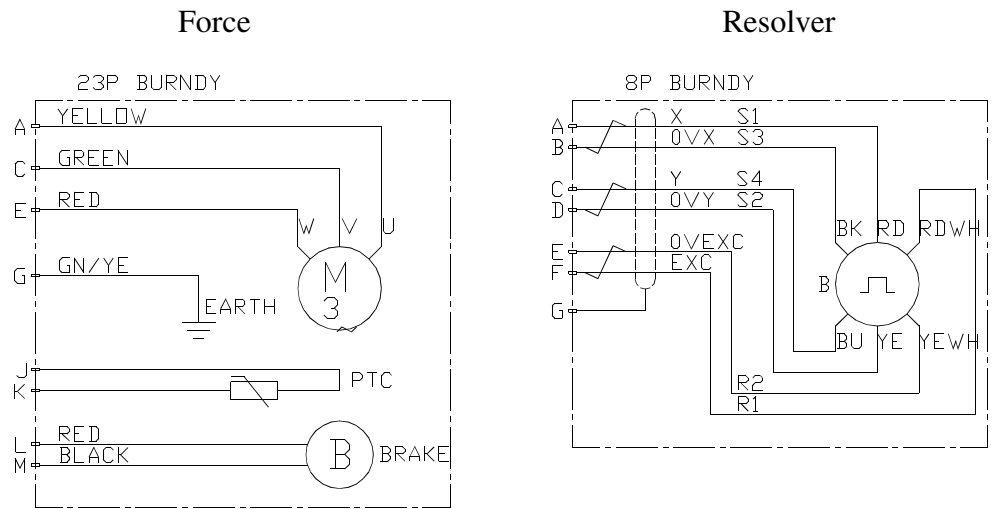
Min. static torque	1.5 Nm
Voltage	$24 \pm 10\%$ V DC
Power consumption at 20° C	12 W

### 2.1.4 Dimensional diagrams



Dimensional diagram "Motor small".

2.1.5 Wiring diagram

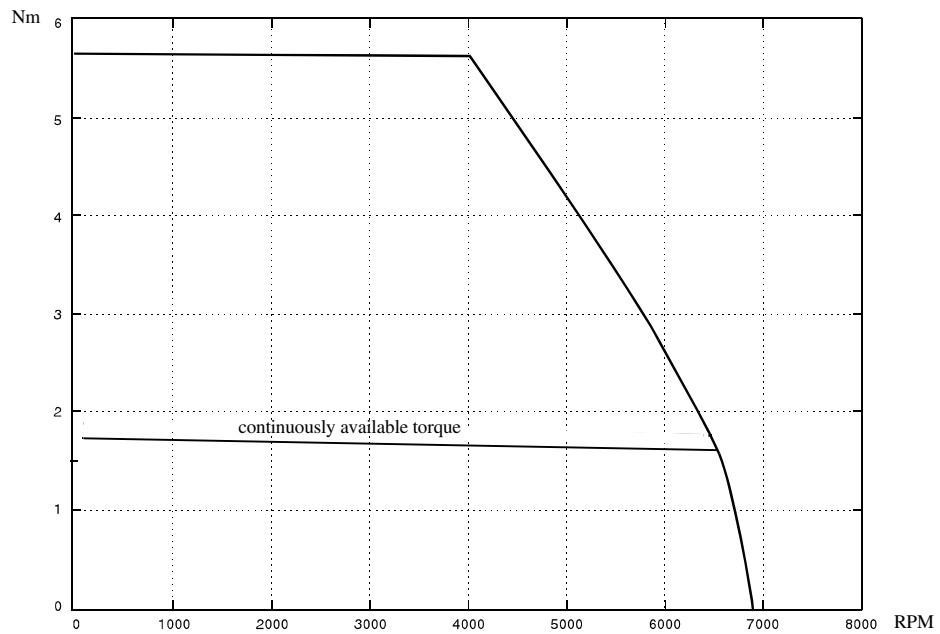


Wiring diagram "Motor small".

2.1.6 Torque curve

Torque - Drive unit T and drive unit G

Torque



3HXD 78012 Torque – Drive unit T and drive unit G

## Technical specification

---

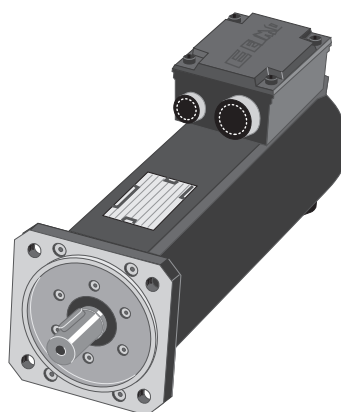
Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

## 2.2 Motor Medium

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### 2.2.1 Illustration

The illustration below shows a “Motor medium”.



“Motor medium”.

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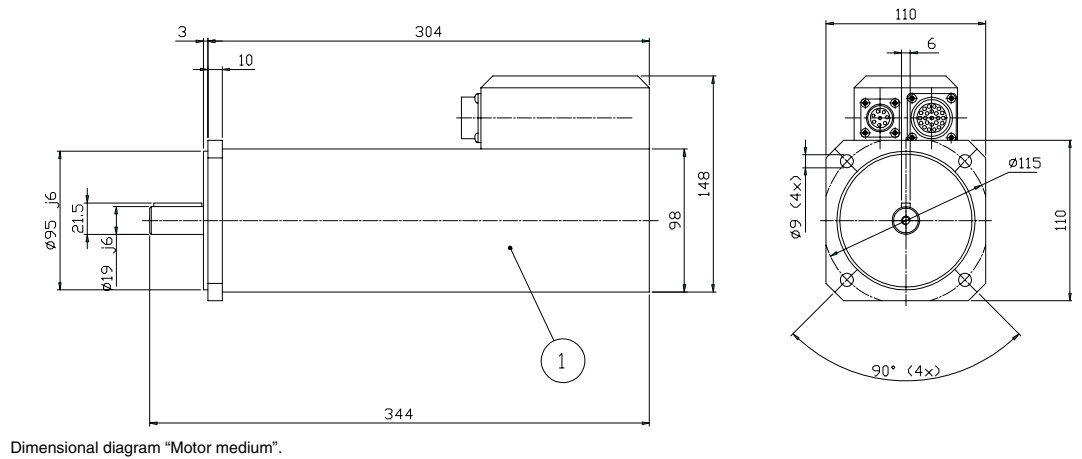
### 2.2.2 Technical data motor

Parameters	Values
Suitable drive unit	T (G possible, but with inferior motor performance)
Nominal rotation speed ( $N_{nom}$ )	4500 r/min(recommended max. rotation speed 3300 r/min)
Nominal torque ( $T_N$ )	5.0 Nm
Max. dynamic torque	13.5 Nm
Max. current ( $I_{max.}$ )	36.8 A
Current at torque $T_N$ ( $I_{RMS}$ )	9.5 A
Torque constant ( $K_T$ )	0.48 Nm/A
Winding resistance/phase (R)	0.70 ohm
Mass torque incl. brake (J)	0.00047 kgm <sup>2</sup>
Number of pairs of poles	3
Winding inductance/phase (L)	2.6 mH
Weight (M)	8.2 kg
Temperature range	+5° - +45°C
Voltage constant, main voltage, ( $K_E(U_{RMS})/1000$ r/min)	29.0 V
Nominal output	1.9 KW

**2.2.3 Brake**

Min. static torque	4 Nm
Voltage	24 ± 10% V DC
Power consumption at 20° C	14 W

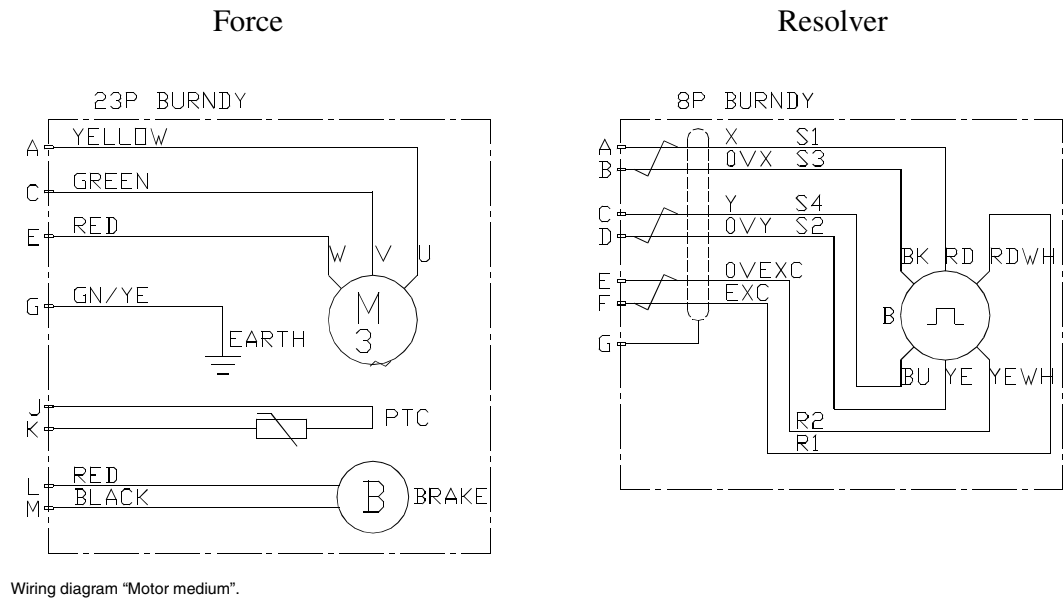
**2.2.4 Dimensional diagrams**



## Technical specification

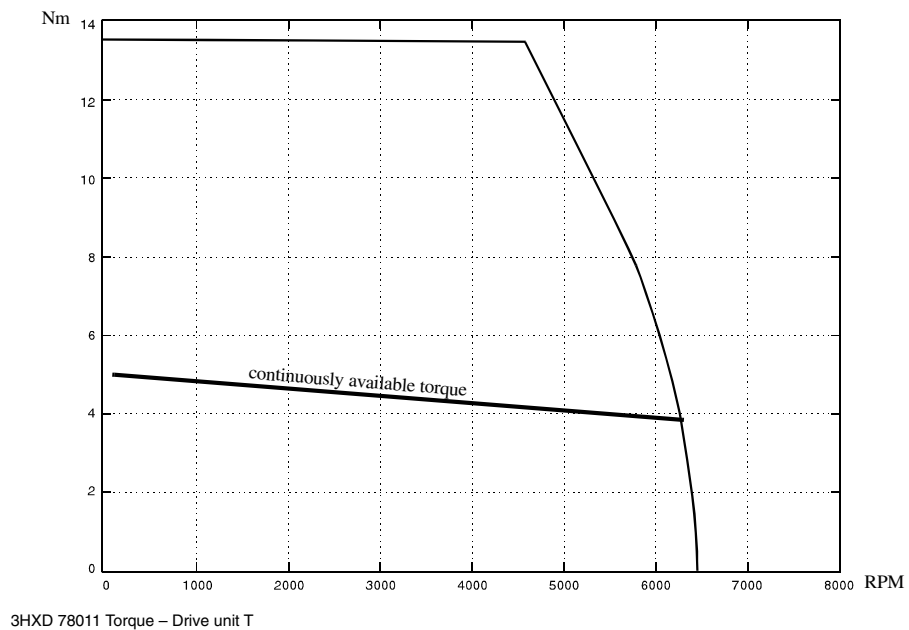
Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

### 2.2.5 Wiring diagram



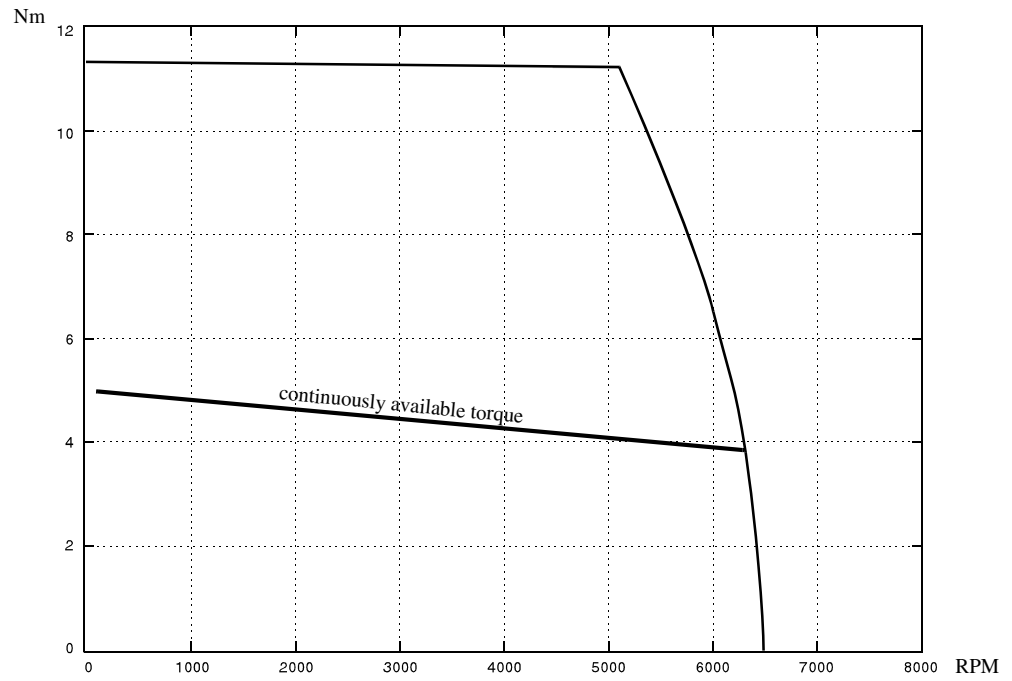
### 2.2.6 Torque curve

Torque – Drive unit T





Torque – Drive unit G

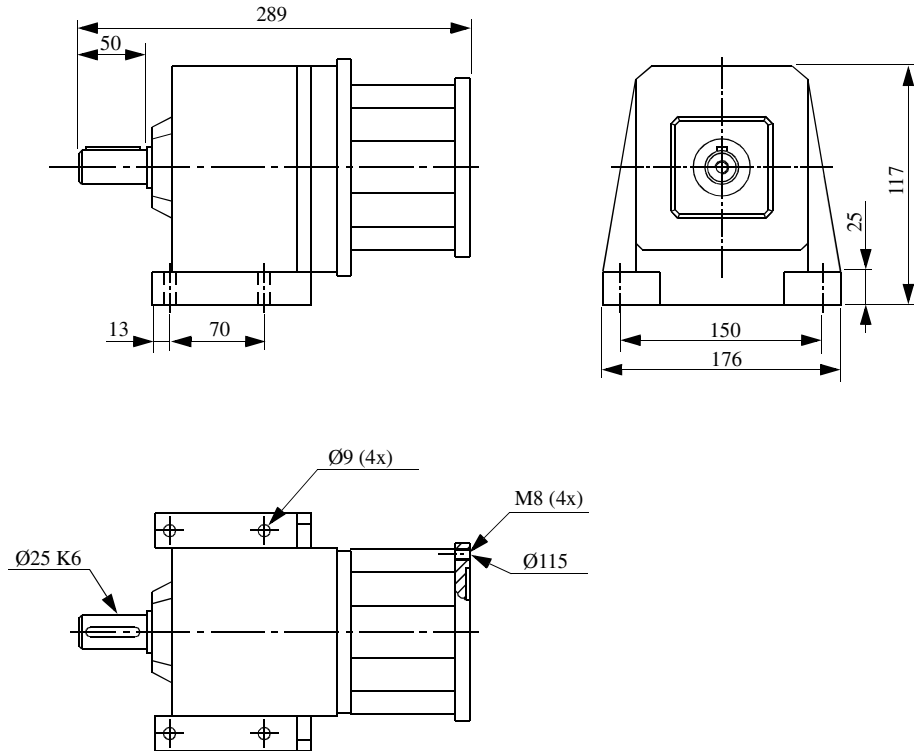


3HXD 78006 Torque – Drive unit G

## Technical specification

Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

### 2.2.7 Gearbox for Motor Medium



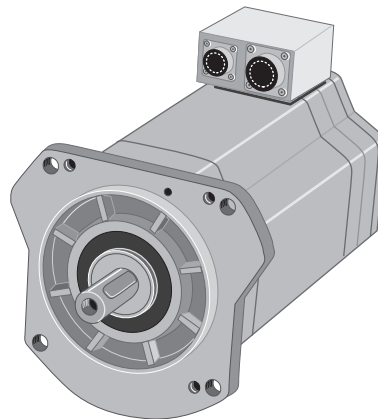
Gearbox "Motor medium".

Transmission	9.326: 1
Highest gear	4095
Lowest gear	260
Max. radial force on the axis (500 r/min)	1600 N
Max. radial force on the axis (20 r/min)	3700 N
Max backlash	0° 13'
*Quantity of oil (horizontally mounted)	600 cc
Quantity of oil (axis pointed downwards)	1160 cc
Weight	17 kg
*Included on delivery	600 cc
Recommended oil type	Mobilgear 630 (CLP 220)

## 2.3 Motor Large

### 2.3.1 Illustration

The illustration below shows a “Motor Large”.



"Motor Large".

### 2.3.2 Technical data motor

Parameters	Values
Suitable drive unit	T (G possible, but with inferior motor performance)
Nominal rotation speed ( $N_{nom}$ )	3083 r/min
Nominal torque ( $T_N$ )	12.0 Nm
Max. dynamic torque	26 Nm
Max. current ( $I_{max.}$ )	36.8 A
Current at torque $T_N$ ( $I_{RMS}$ )	23.3 A
Torque constant ( $K_T$ )	0.88 Nm/A
Winding resistance/phase (R)	0.12 ohm
Mass torque incl. brake (J)	0.00352 kgm <sup>2</sup>
Number of pairs of poles	3
Winding inductance/phase (L)	1.5 mH
Weight (M)	20.8 kg
Temperature range	+5° - +45°C
Voltage constant, main voltage, ( $K_E(U_{RMS})/1000$ r/min)	29.0 V
Nominal output	5.8 KW

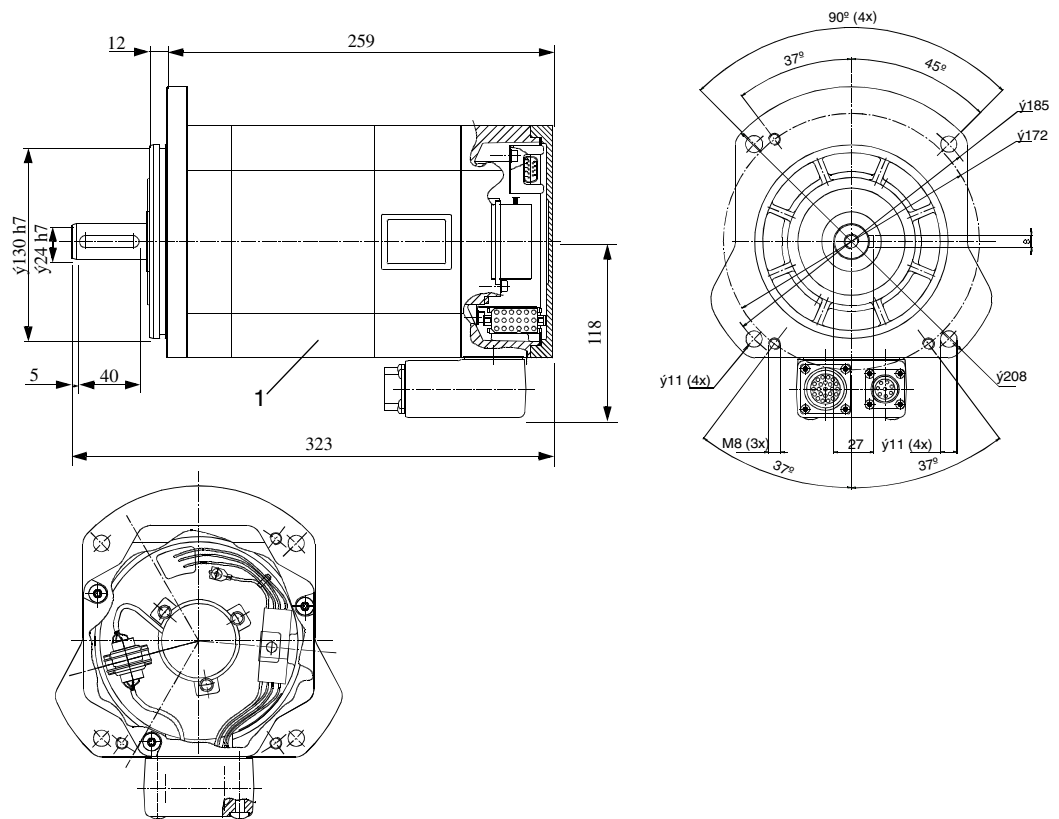
## Technical specification

Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

### 2.3.3 Brake

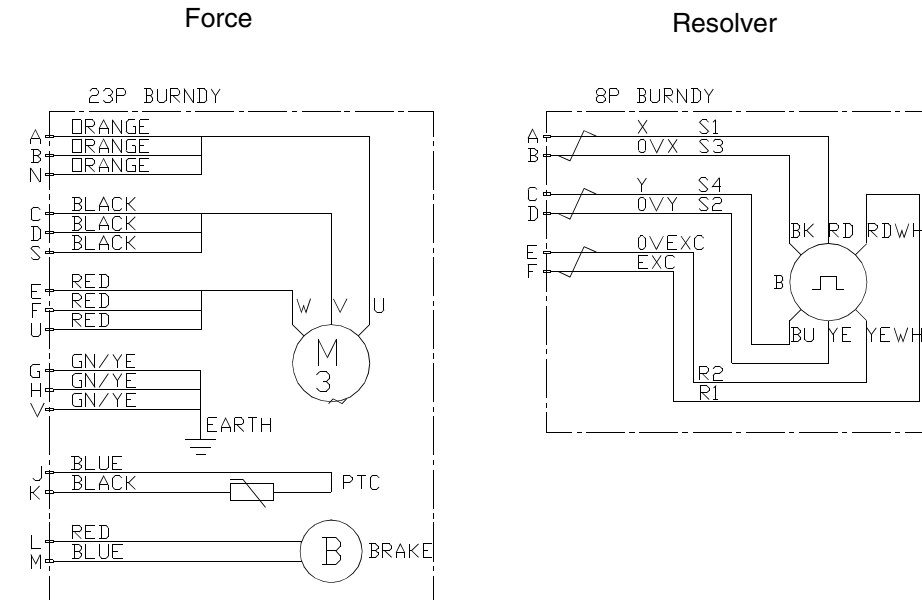
Min. static torque	16 Nm
Voltage	24 ± 10% V DC
Power consumption at 20° C	16 W

### 2.3.4 Dimensional diagrams



Dimensional diagram "Motor Large".

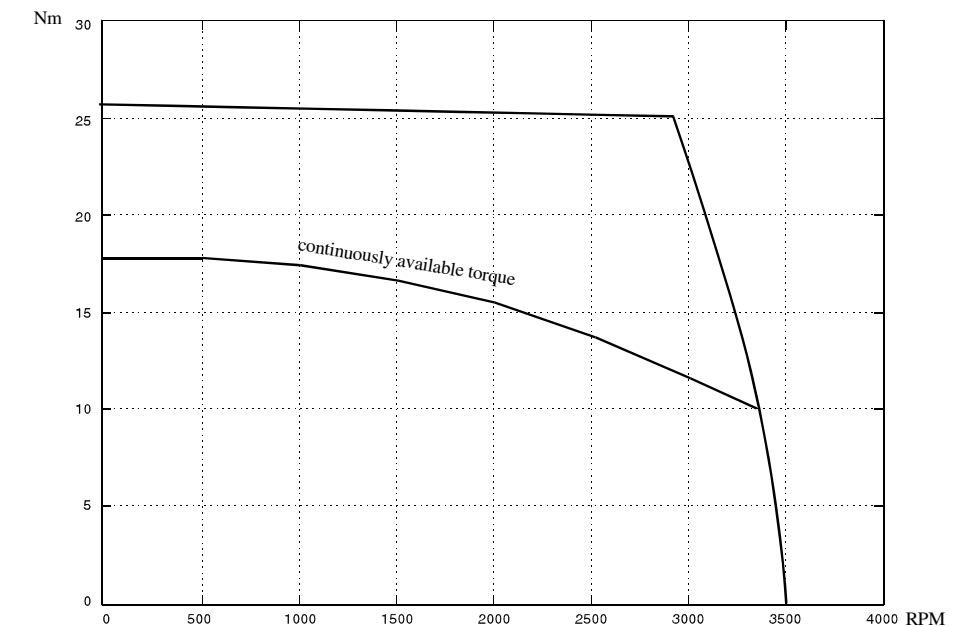
2.3.5 Wiring diagram



Wiring diagram "Motor Large".

2.3.6 Torque curve

Torque – Drive unit T

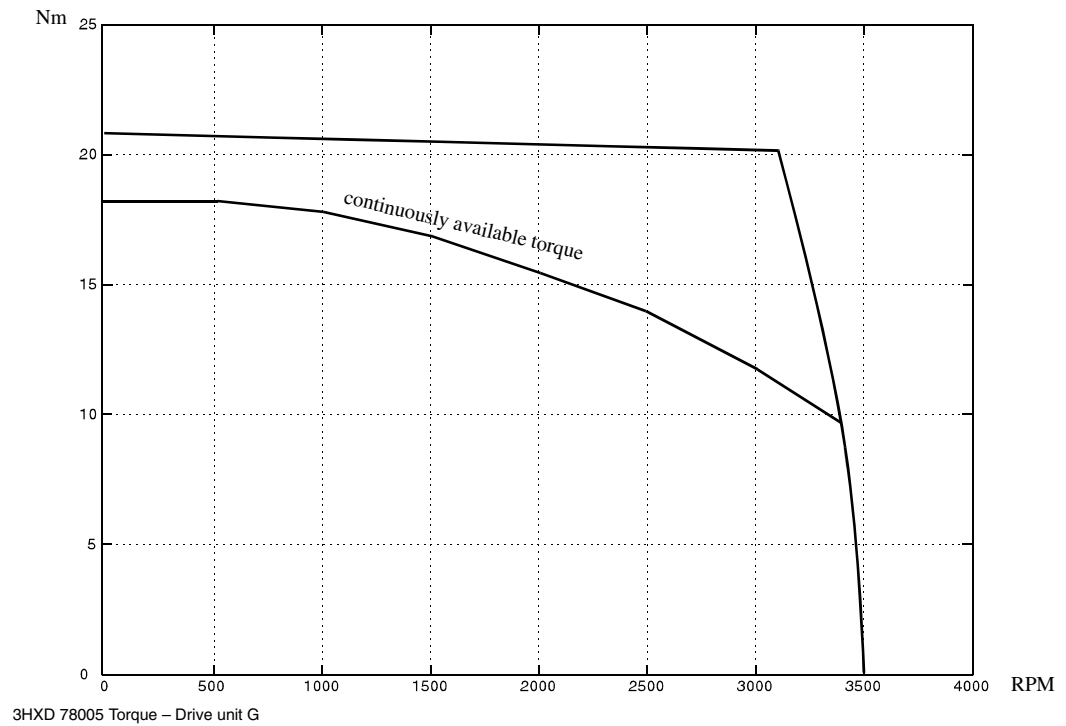


3HXD 78010 Torque – Drive unit T

## Technical specification

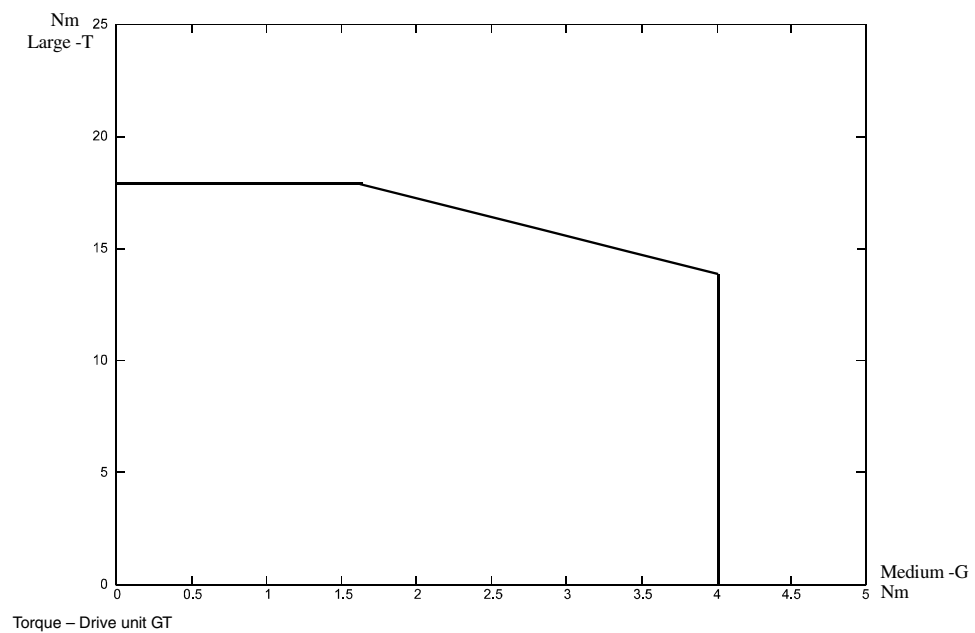
Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

### Torque – Drive unit G



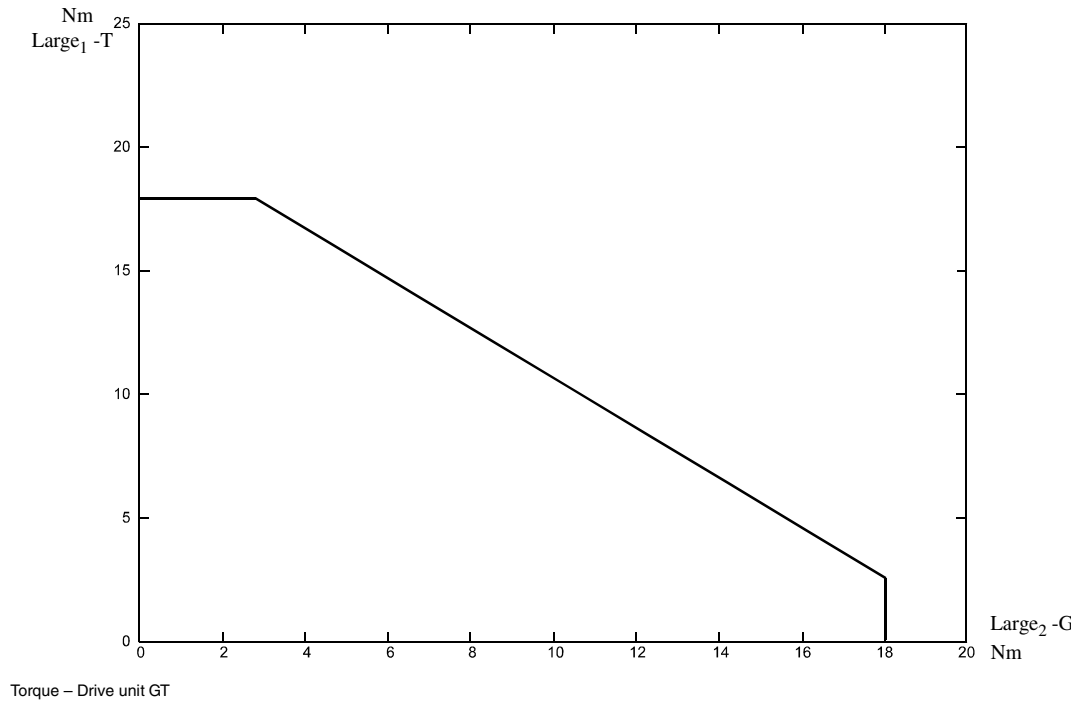
### 2.3.7 Torque curve Motor Large+Medium

#### Torque – Drive unit GT (continuously available torque 0 r/min)

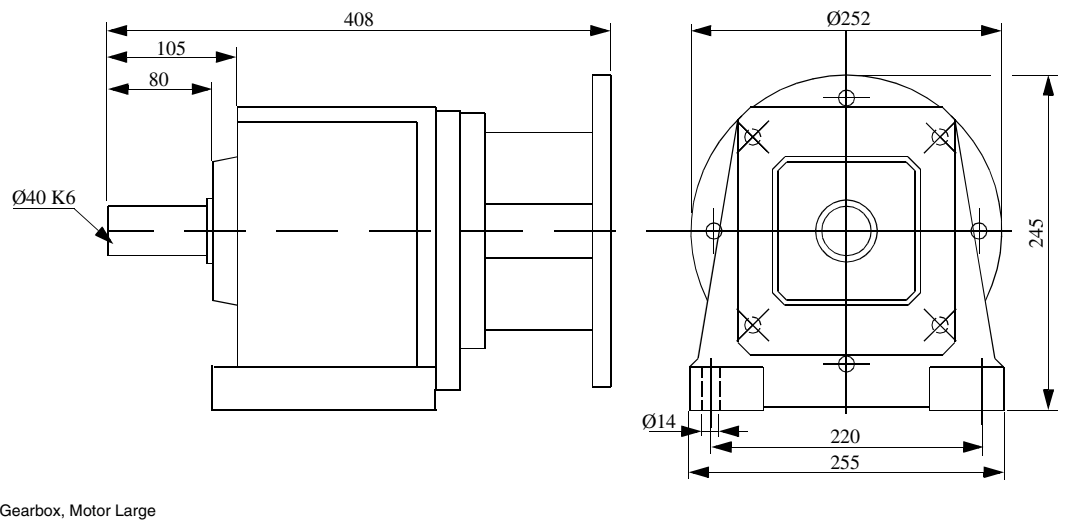


### 2.3.8 Torque curve Motor Large+Large

Torque – Drive unit GT (continuously available torque 0 r/min)



### 2.3.9 Gearboxes for Motor Large



## Technical specification

Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

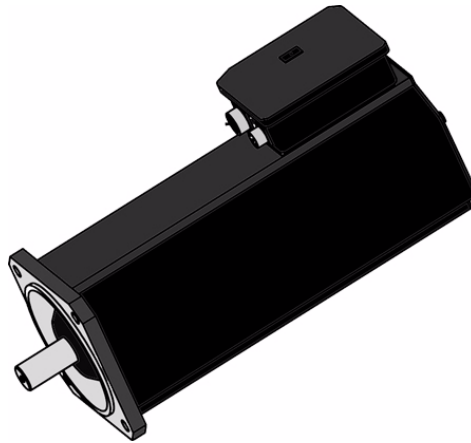
	Transmission 16:1	Transmission 31:1
Transmission	15.75: 1	31.15:1
Highest gear	4095	5670
Lowest gear	260	182
Max. radial force on the axis (500 r/min)	5800 N	6500 N
Max. radial force on the axis (20 r/min)	10,000 N	10,000 N
Max backlash	0° 10'	0° 10'
*Quantity of oil (horizontally mounted)	2200 cc	2200 cc
Quantity of oil (axis pointed downwards)	3750 cc	3750 cc
Weight	36 kg	36 kg
*Included on delivery		
Recommended oil type Mobilgear 630 (CLP 220)		



## 2.4 Motor X-Large

### 2.4.1 Illustration

The illustration below shows a “Motor X-Large”.



“Motor X-Large”.

### 2.4.2 Technical data motor

Parameters	Values
Suitable drive unit	U (T, G possible, but with inferior motor performance)
Nominal rotation speed ( $N_{nom}$ )	3400 r/min
Nominal torque ( $T_N$ )	23 Nm
Max. dynamic torque	52 Nm (based on drive unit U)
Max. current ( $I_{max.}$ )	55 A
Current at torque $T_N$ ( $I_{RMS}$ )	23 A
Torque constant ( $K_T$ )	1.04 Nm
Winding resistance/phase (R)	0.14 ohm
Mass torque incl. brake (J)	
Number of pairs of poles	
Winding inductance/phase (L)	1.6 mH
Weight (M)	21.6 kg (excl. brake)
Temperature range	+5 - +45
Voltage constant, main voltage, ( $K_E(U_{RMS})/1000$ r/min)	63.4 V
Nominal output	8.2 kW

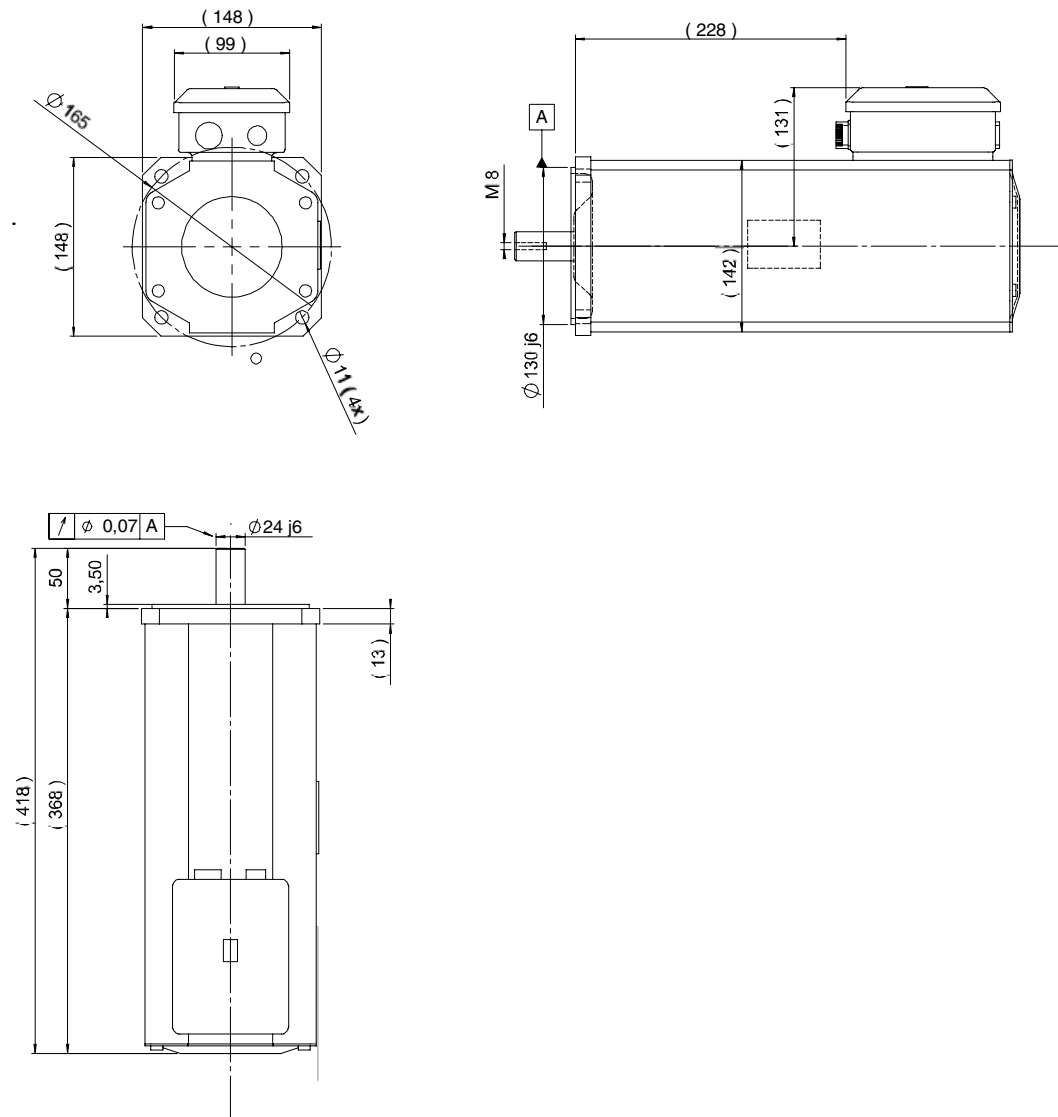
## Technical specification

Low voltage motors, for IRB 1400, 2400, 4400 and 6400R

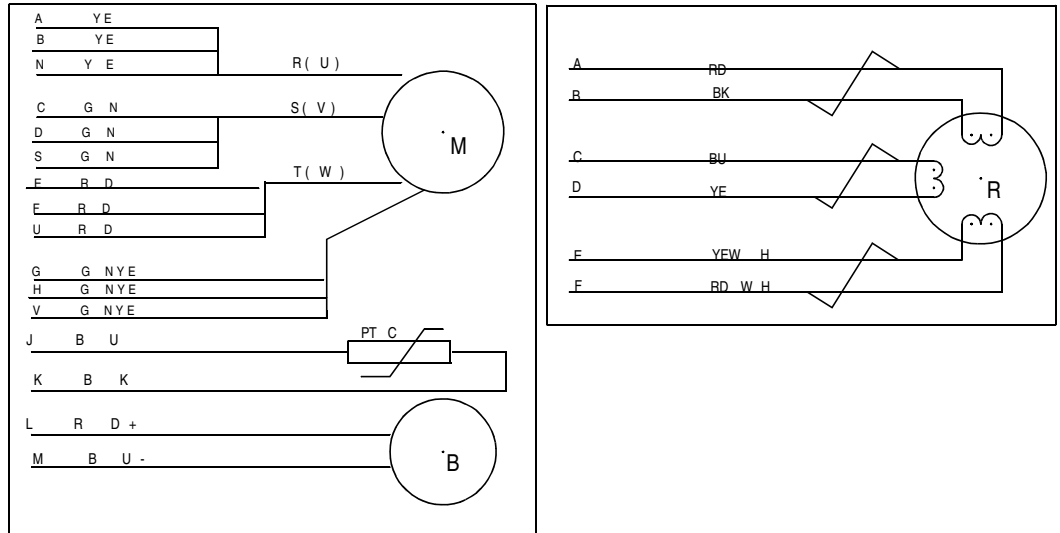
### 2.4.3 Brake

Min. static torque	16 Nm
Voltage	24 ± 10% V DC
Power consumption at 20° C	16 W

### 2.4.4 Dimensional diagrams



### 2.4.5 Wiring diagram



Wiring diagram "Motor X-Large".

### 2.4.6 Torque curves



Contact ABB for information on torque curves.

## Technical specification

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High voltage motors, for IRB 6600/7600

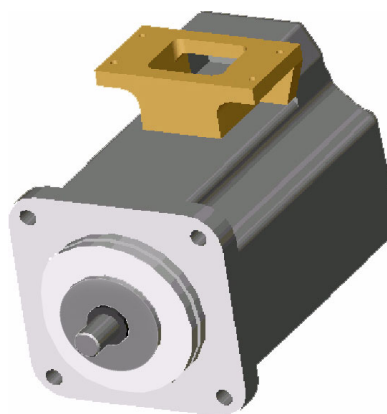
## B High voltage motors, for IRB 6600/7600

### 2.5 Motor Medium

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#### 2.5.1 Illustration

The illustration below shows a “Motor medium”.



“Motor medium”.

---

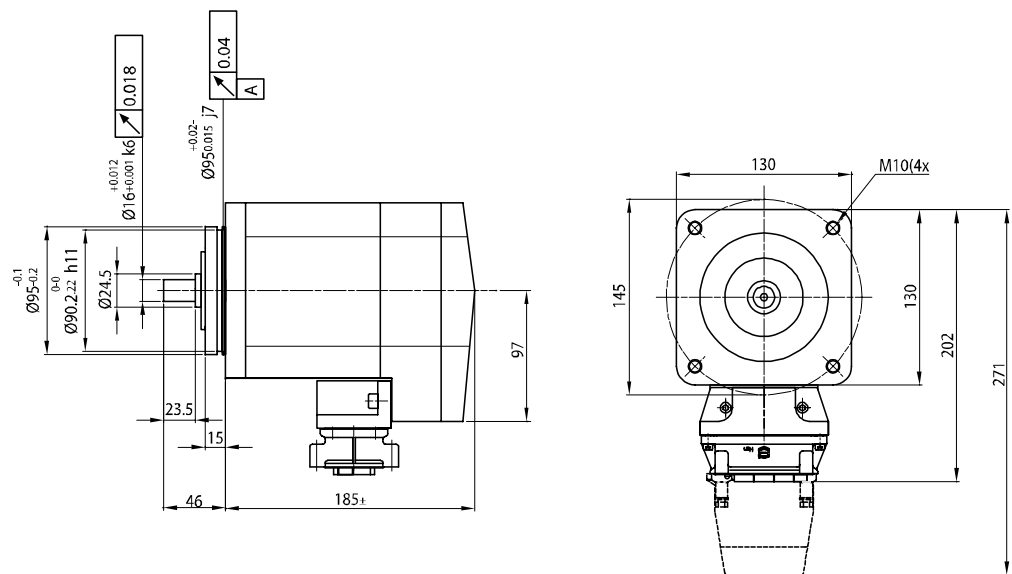
#### 2.5.2 Technical data motor

Parameters	Values
Suitable drive unit	W
Nominal rotation speed ( $N_{nom}$ )	2500 r/min
Nominal torque ( $T_N$ )	6.5 Nm
Max. dynamic torque	12.5 Nm
Max. current ( $I_{max.}$ )	26 A
Current at torque $T_N$ ( $I_{RMS}$ )	5 A
Torque constant ( $K_T$ )	0.868 Nm/A
Winding resistance/phase (R)	0.675 ohm
Mass torque incl. brake (J)	0.000899 kgm <sup>2</sup>
Number of pairs of poles	8
Winding inductance/phase (L)	4.3 mH
Weight (M)	9 kg
Temperature range	+5° - +40°C
kE ( $kT=1.1$ Nm/A rms)	0.5011 V
Nominal output	1.7 kW

### 2.5.3 Brake

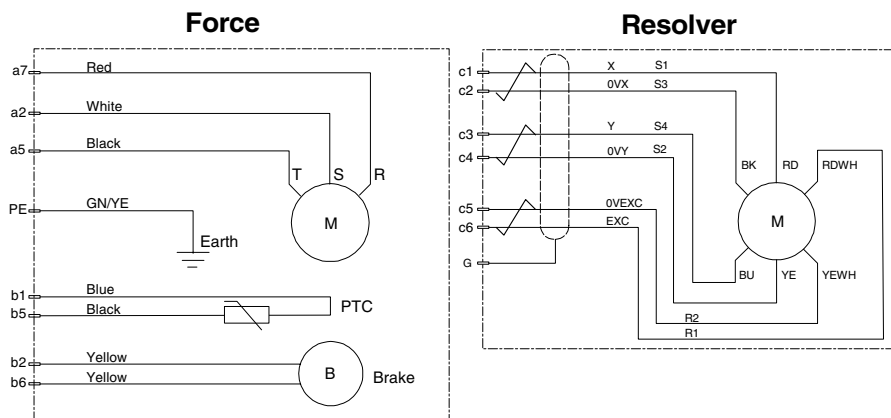
Min. static torque	7 Nm
Voltage	24 ± 10% V DC
Power consumption at 20° C	21.1 W

### 2.5.4 Dimensional diagrams



Dimensional diagram "Motor medium".

### 2.5.5 Wiring diagram



Wiring diagram "Motor medium".

## Technical specification

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High voltage motors, for IRB 6600/7600

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### 2.5.6 Torque curves

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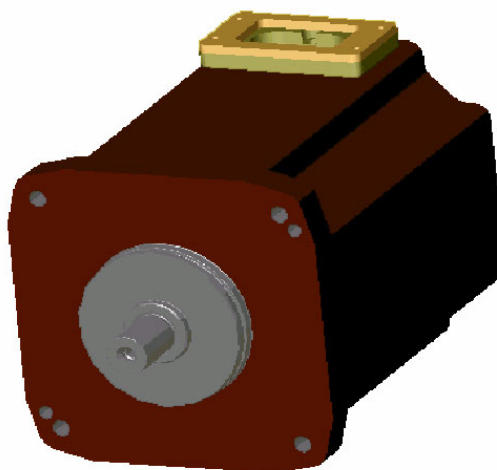


Contact ABB for information on torque curves.

## 2.6 Motor Large

### 2.6.1 Illustration

The illustration below shows a “Motor Large”.



“Motor Large”.

### 2.6.2 Technical data motor

Parameters	Values
Suitable drive unit	W
Nominal rotation speed ( $N_{nom}$ )	1771 r/min
Nominal torque ( $T_N$ )	21.7 Nm
Max. dynamic torque	47 Nm
Max. current ( $I_{max.}$ )	57 A
Current at torque $T_N$ ( $I_{RMS}$ )	14 A
Torque constant ( $K_T$ )	1.136 Nm/A
Winding resistance/phase (R)	0.14 ohm
Mass torque incl. brake (J)	0.00529 kgm <sup>2</sup>
Number of pairs of poles	8
Winding inductance/phase (L)	1.62 mH
Weight (M)	25 kg
Temperature range	+5° - +40°C
kE ( $kT=1.1$ Nm/A rms)	0.635 V
Nominal output	4.0 kW

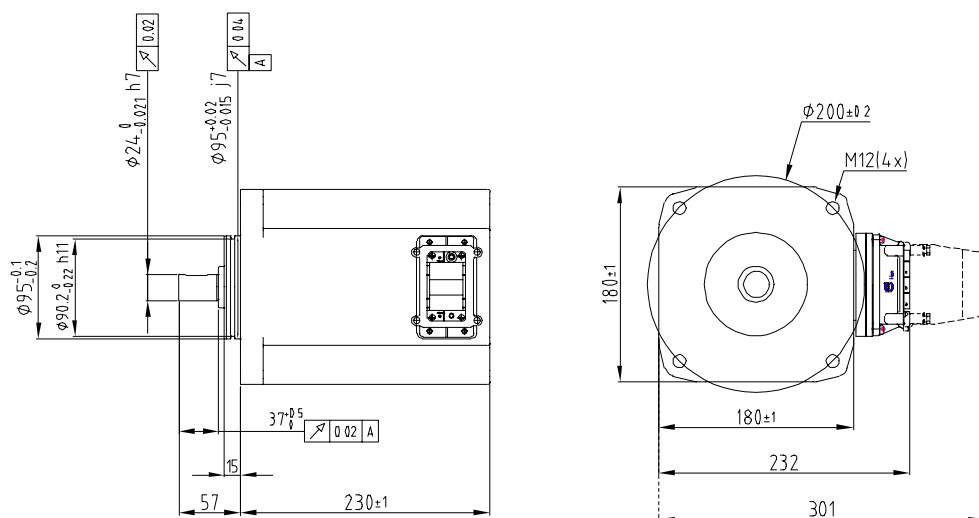
## Technical specification

High voltage motors, for IRB 6600/7600

### 2.6.3 Brake

Min. static torque	28 Nm
Voltage	$24 \pm 10\%$ V DC
Power consumption at 20° C	25.3 W

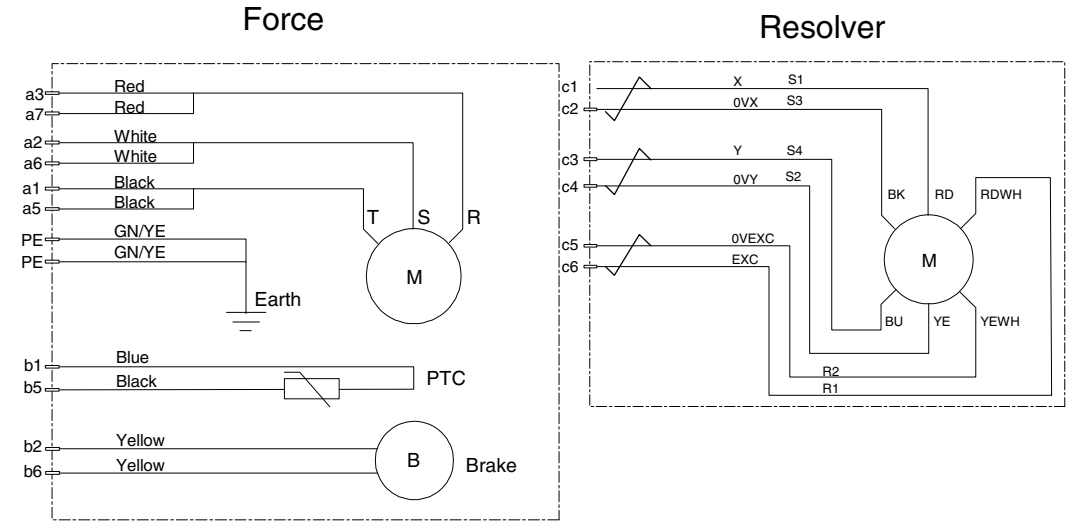
### 2.6.4 Dimensional diagrams



Dimensional diagram "Motor Large".



### 2.6.5 Wiring diagram



Wiring diagram "Motor Large".

### 2.6.6 Torque curves

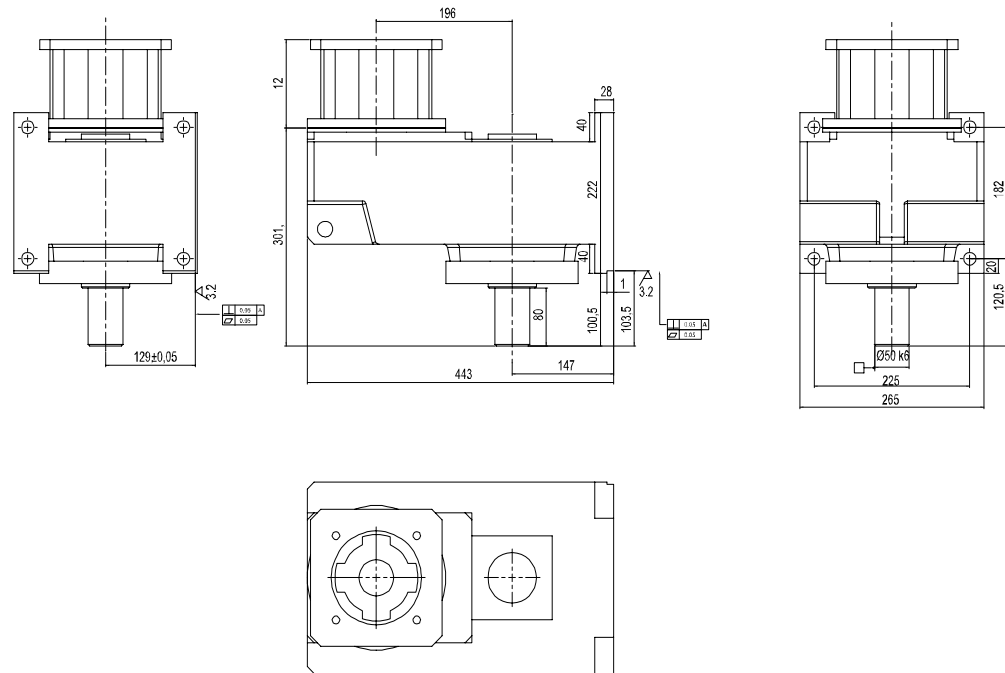


Contact ABB for information on torque curves.

## Technical specification

High voltage motors, for IRB 6600/7600

### 2.6.7 Gearboxes for Motor Large



Gearbox, Motor Large

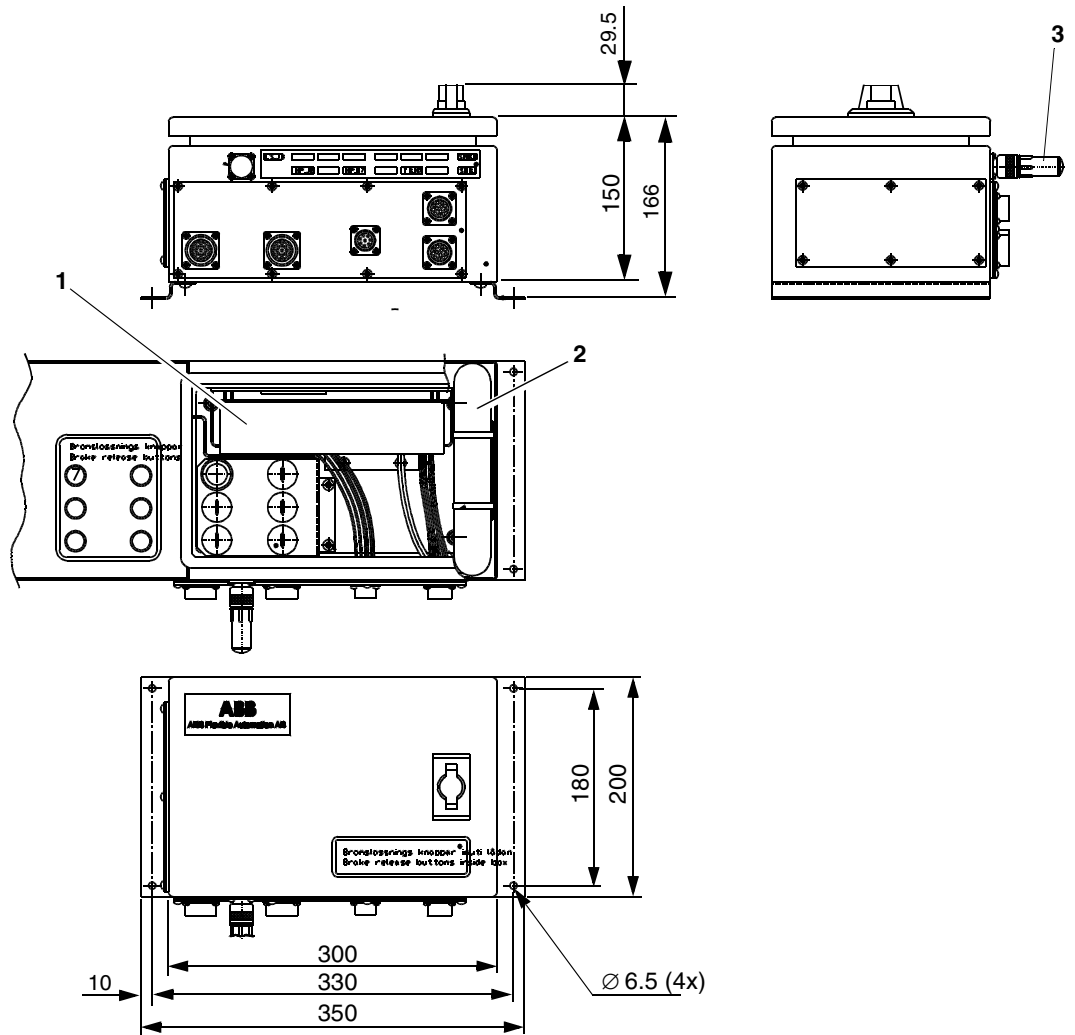
	Transmission 28:1	Transmission 35:1
Highest gear	1	1
Lowest gear	1	1
Max. radial force on the axis (500 r/min)	1	1
Max. radial force on the axis (20 r/min)	1	1
Max backlash	0° 10'	0° 10'
*Quantity of oil (horizontally mounted)	2200 cc	2200 cc
Quantity of oil (axis pointed downwards)	3750 cc	3750 cc
Weight	36 kg	36 kg
*Included on delivery		
Recommended oil type Mobilgear 630 (CLP 220)		

1.Contact ABB for information.

## C Serial measurement boxes

### 2.7 Low voltage

#### 2.7.1 One motor



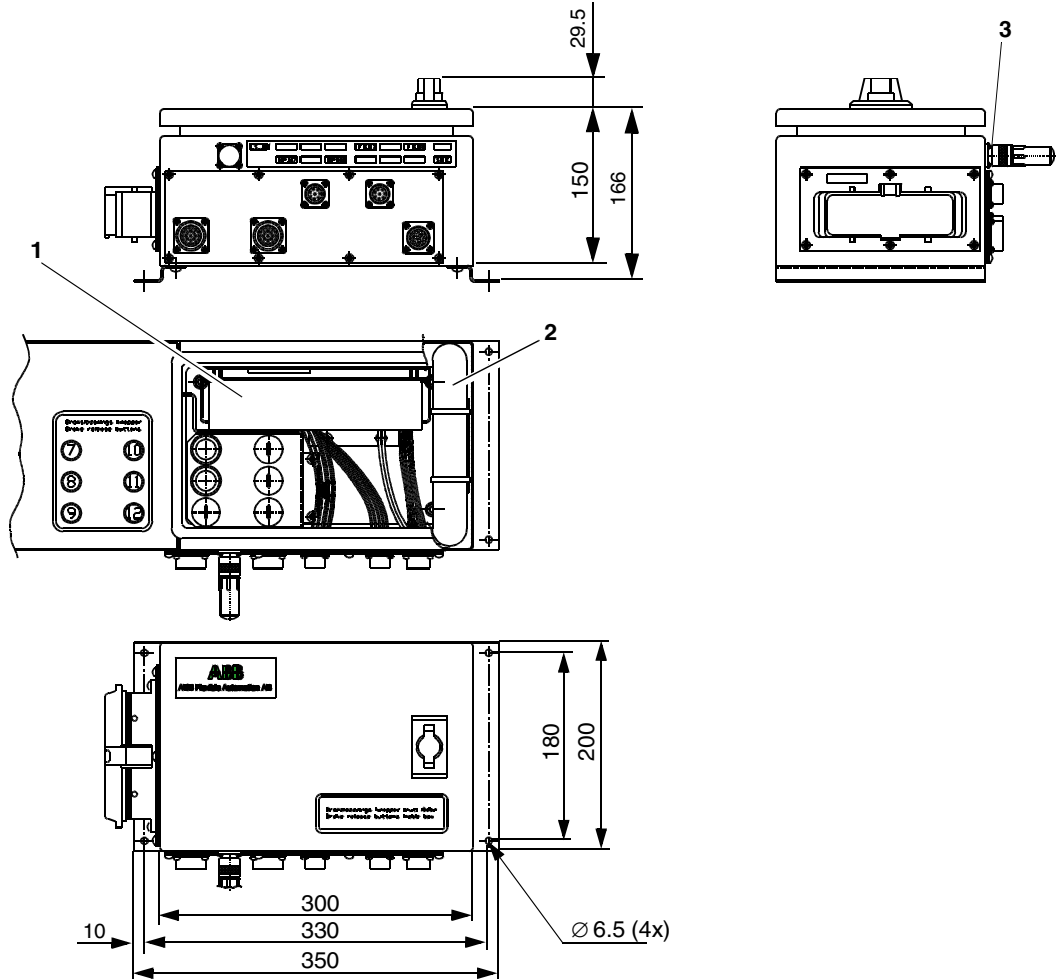
Serial measurement box for one motor

Part	Quantity	Name	Part number	Remarks
1	1	Serial measurement card	3HAB 3700-1	
2	1	Battery	4944 026-4	
3	1	Connecting limit switches	3HXD 0100-122	

## Technical specification

### Serial measurement boxes

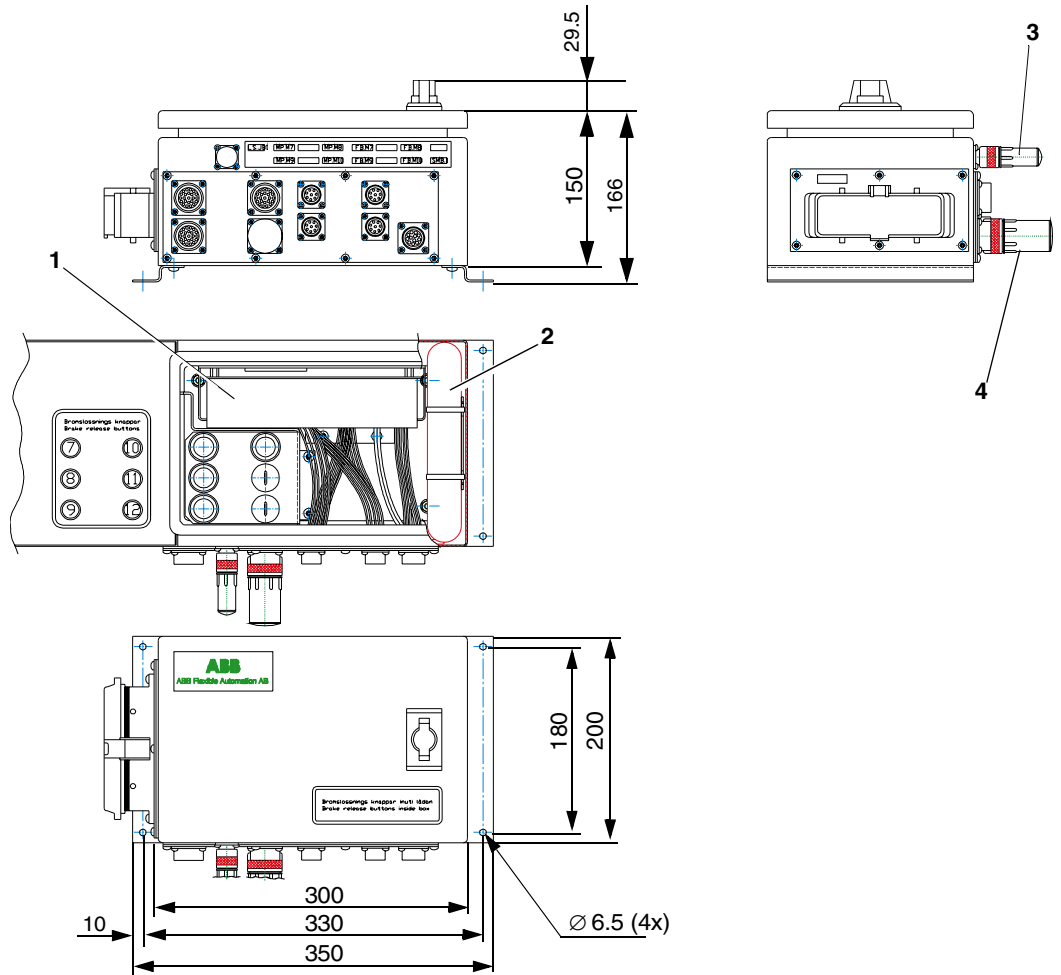
#### 2.7.2 Two motors



Serial measurement box for two motors

Part	Quantity	Name	Part number	Remarks
1	1	Serial measurement card	3HAB 3700-1	
2	1	Battery	4944 026-4	
3	1	Connecting limit switches	3HXD 0100-122	
4	1	Connecting motor PTC	3HXD 0100-124	

2.7.3 Four motors



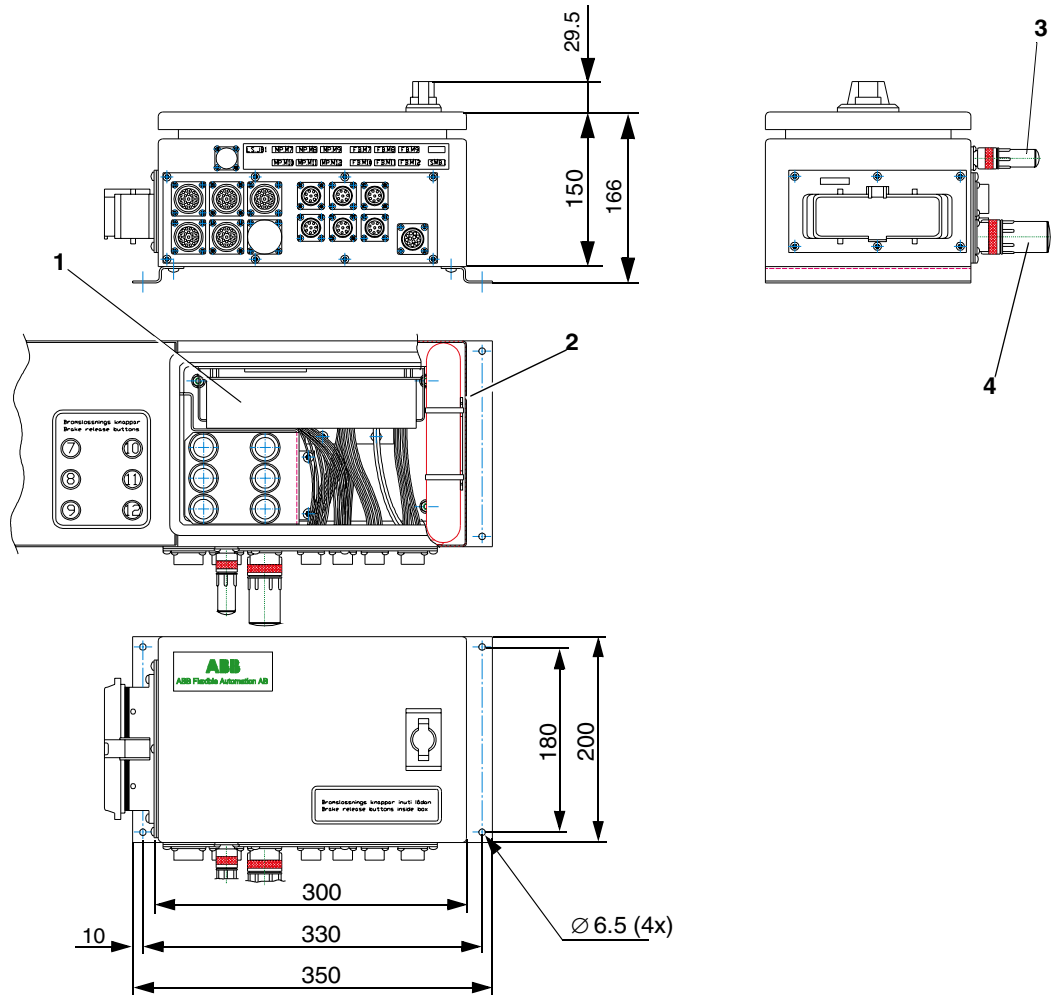
Serial measurement box for four motors

Part	Quantity	Name	Part number	Remarks
1	1	Serial measurement card	3HAB 3700-1	
2	1	Battery	4944 026-4	
3	1	Connecting switch limit	3HXD 0100-122	
4	1	Connecting motor PTC	3HXD 0100-124	

# Technical specification

## Serial measurement boxes

### 2.7.4 Six motors

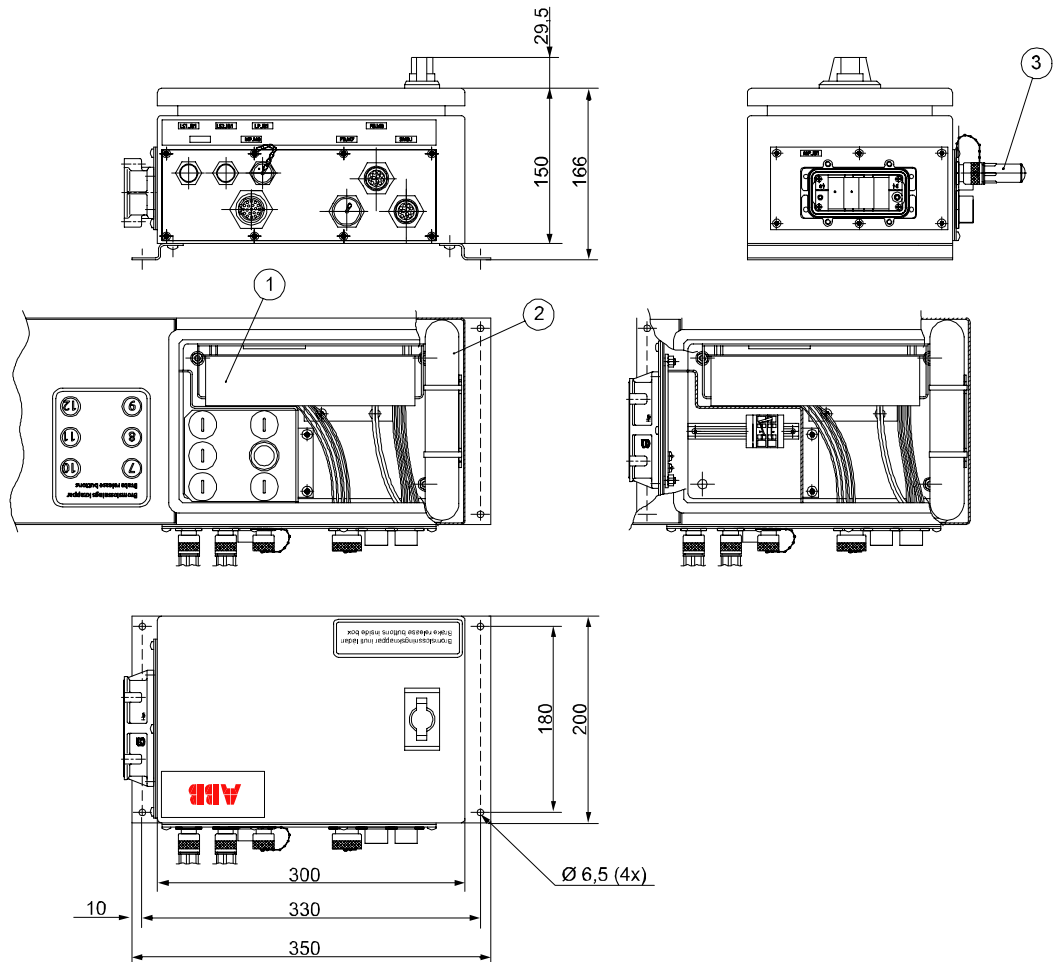


Serial measurement box for six motors

Part	Quantity	Name	Part number	Remarks
1	1	Serial measurement card	3HAB 3700-1	
2	1	Battery	4944 026-4	
3	1	Connecting switch limit	3HXD 0100-122	
4	1	Connecting motor PTC	3HXD 0100-124	

## 2.8 High voltage

### 2.8.1 One motor

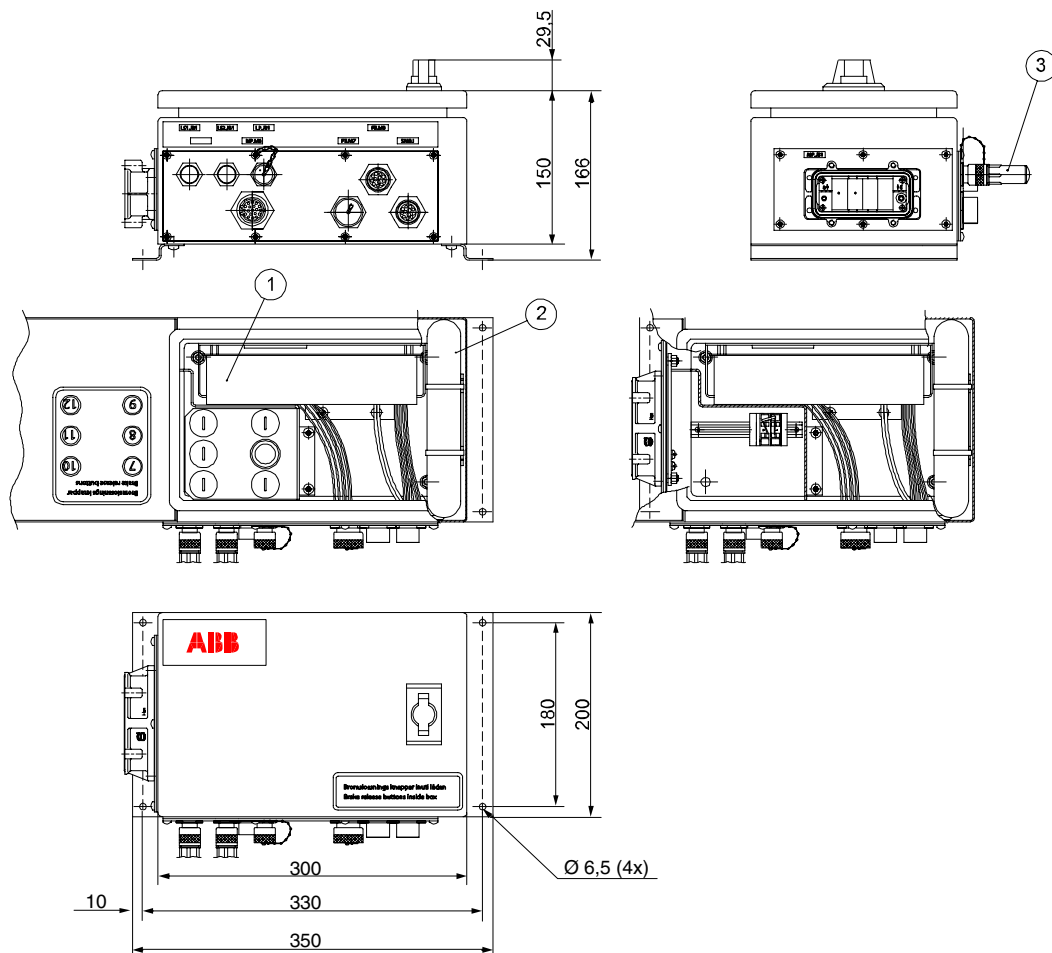


Part	Quantity	Name	Part number	Remarks
1	1	Serial measurement card	3HXD 14505-1	
2	1	Battery	4944 026-4	
3	1	Connecting limit switches	3HXD 0100-366	

## Technical specification

### Serial measurement boxes

#### 2.8.2 Two motors

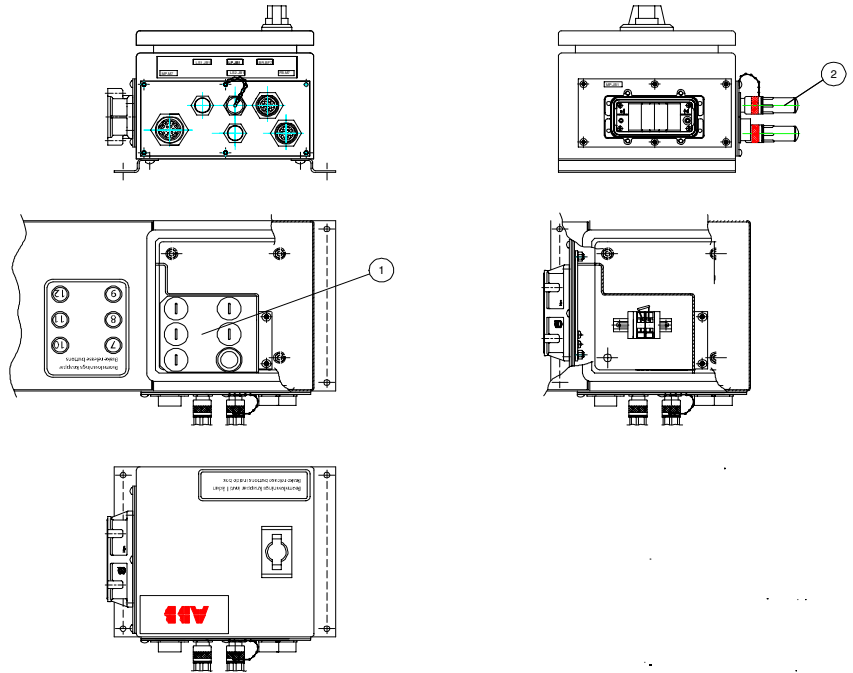


Part	Quantity	Name	Part number	Remarks
1	1	Serial measurement card	3HXD 14505-1	
2	1	Battery	4944 026-4	
3	1	Connecting limit switches	3HXD 0100-366	



## D Brake release box (BRB)

### 2.9 High voltage motor



Part	Quantity	Name	Part number	Remarks
1	1	Brake release buttons		
2	1	Connecting limit switches	3HXD 0100-363	

## Technical specification

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Brake release box (BRB)

### 3 Electrical installation

#### E One external axis

##### 3.1 General

One external axis is normally connected to the robot's serial measurement system, one (MS1) in series with the robot.

##### 3.2 Low voltage motors

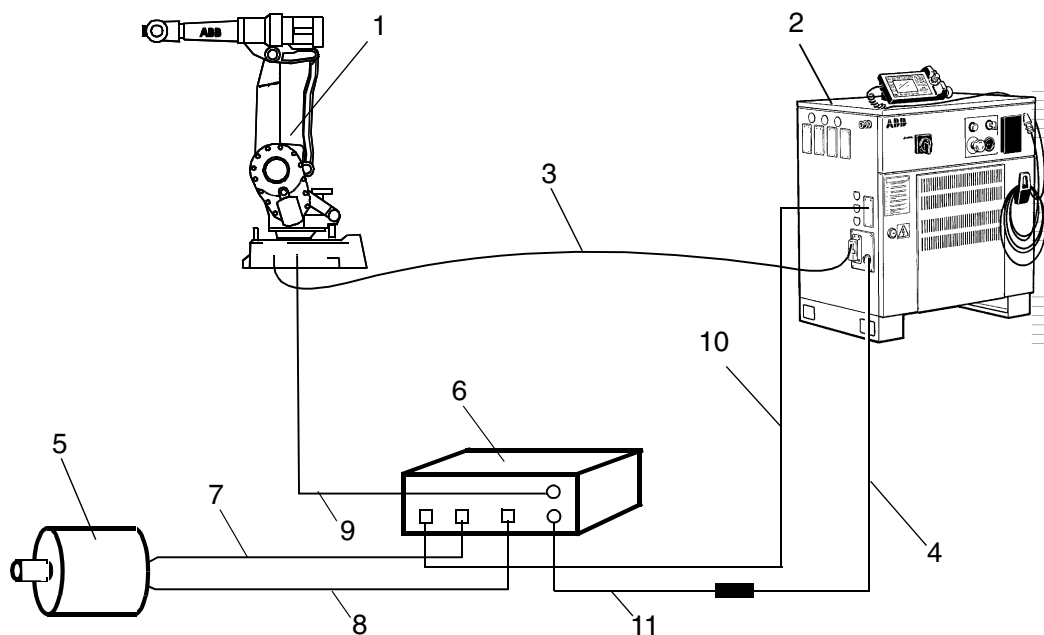
###### 3.2.1 Installation into one cabinet for 1400, 2400, 4400, 6400R

Connect the motor unit as follows:

Cable	Connections
The external axis' serial measurement cable	is connected between the serial measurement box (SMB.I) and the robot foot (R1.SMB).
The resolver cable	is connected between the serial measurement box (FB.M7) and the motor.
The motor cable	is connected between the serial measurement box (MP.M7) and the motor.
The external axis' motor cable	is connected between the serial measurement box (MP.JB1) and the control cabinet (XS.7).
The robot's motor cable	is connected between the robot foot (R1.MP) and the control cabinet (XS.1).
The robot's measurement cable	is connected between the serial measurement box (SMB.I) and the control cabinet (XS.2).
The extension for the robot's measurement cable	is connected between the robot's serial measurement cable (if it requires extension) and the serial measurement box (SMB.I)

## Electrical installation

One external axis



One external axis

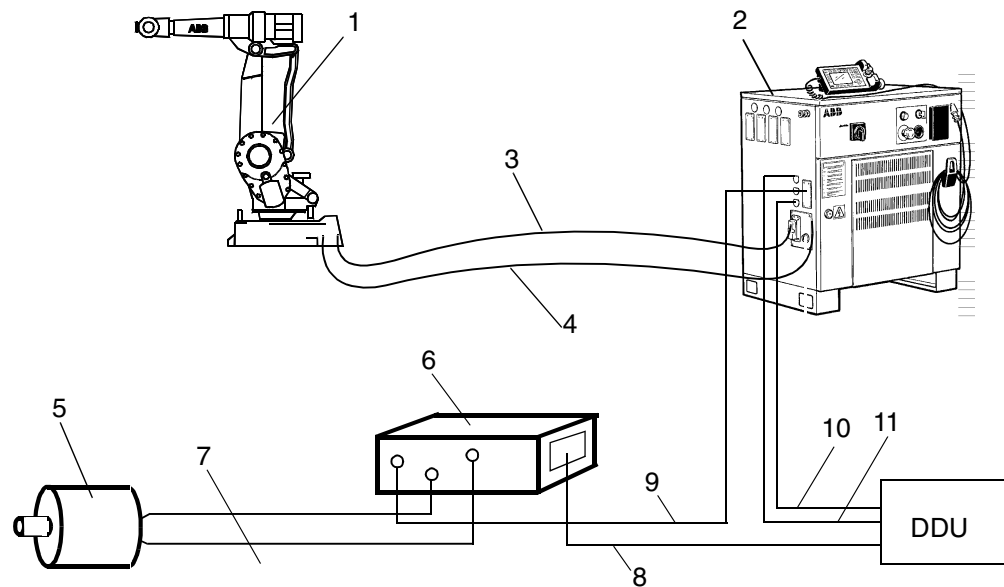
Part	Name
1	Robot
2	Control cabinet S4c
3	The robot's motor cable (supplied together with the robot)
4	The robot's serial measurement cable (supplied together with the robot)
5	Motor
6	Serial Measurement Box
7	Motor cable
8	Resolver cable
9	Serial measurement cable
10	Motor cable for several motors
11	Extension for the robot's serial measurement cable

### 3.3 High voltage motors

#### 3.3.1 Installation into one cabinet for IRB 6600/7600 with serial measurement box

Connect the motor unit as follows:

Cable	Connections
The external axis' serial measurement cable	is connected between the serial measurement box (SMB.I) and the control cabinet, (XS.42).
The motor/resolver cable	is connected between the serial measurement box (MP.M8) and the motor.
The external axis' motor cable	is connected between the serial measurement box (MP.JB1) and the DDU cabinet (XS.78).
The robot's motor cable	is connected between the robot foot (R1.MP) and the control cabinet (XS.1).
The robot's measurement cable	is connected between the robot foot (R1.SMB) and the control cabinet (XS.2).



One external axis

Part	Name
1	Robot
2	Control cabinet S4c
3	The robot's motor cable (supplied together with the robot)
4	The robot's serial measurement cable (supplied together with the robot)
5	Motor

## Electrical installation

One external axis

Part	Name
6	Serial Measurement Box
7	Motor/resolver cable
8	Motor cable (external axis)
9	Serial measurement cable (external axis)
10	Signal cable (supplied with DDU cabinet)
11	Power cable (supplied with DDU cabinet)

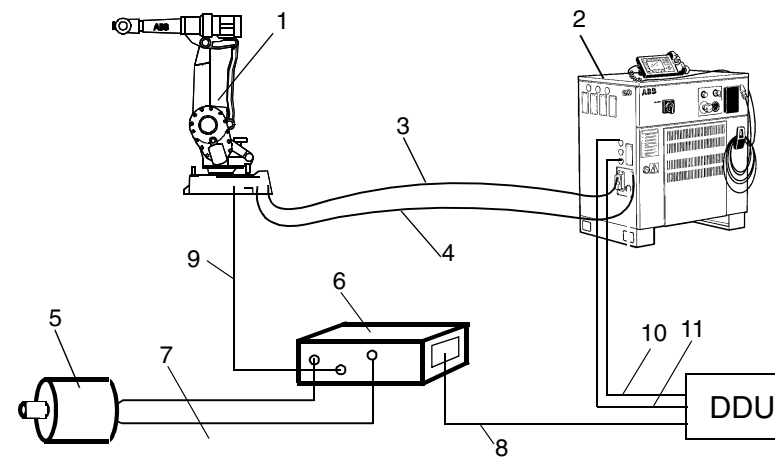
### 3.3.2 Installation into one cabinet for 6600/7600 with brake release box



The brake release box can only be used if option 2204 or 2200 is selected.

Connect the motor unit as follows:

Cable	Connections
External axis' resolver cable	is connected between the brake release box (BRB.FB7) and the robot foot, (R3.FB7)
The motor/resolver cable	is connected between the serial measurement box (MP.M7/FB.M7) and the motor.
The external axis' motor cable	is connected between the brake release box (MP.JB1) and the DDU cabinet (XS.78).
The robot's motor cable	is connected between the robot foot (R1.MP) and the control cabinet (XS.1).
The robot's measurement cable	is connected between the robot foot (R1.SMB) and the control cabinet (XS.2).



One external axis

---

Part	Name
1	Robot
2	Control cabinet S4c
3	The robot's motor cable (supplied together with the robot)
4	The robot's serial measurement cable (supplied together with the robot)
5	Motor
6	Brake release box
7	Motor/resolver cable
8	Motor cable (external axis)
9	Serial measurement cable (external axis)
10	Signal cable (supplied with DDU cabinet)
11	Power cable (supplied with DDU cabinet)

---

# F Several external axes

## 3.4 Introduction

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### 3.4.1 General

Several external axes are connected to the robot's serial measurement system two (MS2).

All S4C and S4C plus robot system can use up to six external axes, but one extra cabinet is required for the electronics in the following cases:

- For IRB 4400/6400 for two or more axes
- For IRB 1400/2400 for four or more axes



**If four or more Medium or Large motor units are operated from a control cabinet, performance may be reduced somewhat when the motors are run simultaneously, with high outgoing torque. The control cabinet cannot deliver maximum power to more than three Medium or Large motors at the same time.**

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### 3.4.2 Operation

For simultaneous operation of four or more Medium or Large motors from the same control system, certain parameters are limited:

One S4C and S4C plus control system with external axis cabinet for external axes can as a maximum be equipped with 3 GT drive units, i.e. 3 T units and 3 G units, mounted in pairs in a GT module with common power pack. These are configured in the serial measurement box as follows:

- 7, 9 and 11, T unit
- 8, 10 and 12, G unit

### 3.4.3 Limitation 1:

Operation of a Motor Small with a G drive unit or a Motor Medium or Motor Large with a T drive unit. Performance is shown in the torque curves in 2.2.6.

---

### 3.4.4 Limitation 2:

The GT drive units have their maximum current set to a lower value than a separate G or T unit. Therefore, simultaneous operation of axes 7-8, 9-10 and 11-12 should be avoided, if the reciprocal cycle makes high use of the motors. Applicable mean torque per motor pair is shown in the torque curves.

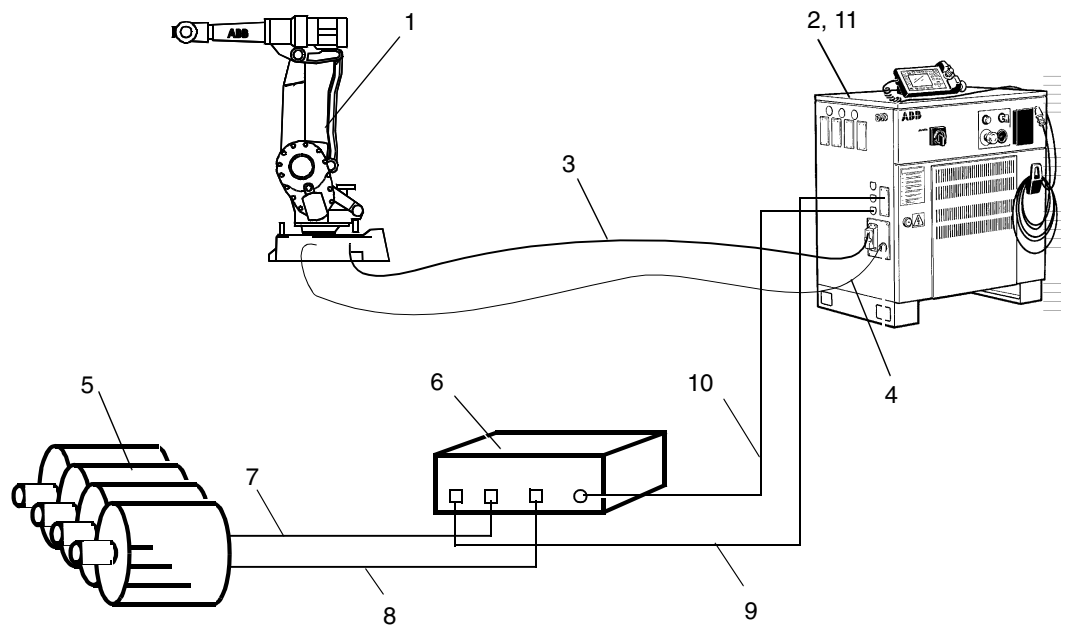


### 3.5 Low voltage motors

#### 3.5.1 Installation into one cabinet for 1400, 2400, 4400, 6400R

Connect the motor units as follows:

Cable	Connections
The external axis' serial measurement cable	is connected between the serial measurement box (SMB.1) and the robot foot (XS41).
The resolver cable	is connected between the serial measurement box (FB.MX) and the motors.
The motor cable	is connected between the serial measurement box (MP.M7) and the motors.
The external axis' motor cable	is connected between the serial measurement box (MP.JB1) and the control cabinet (XS7).
The robot's motor cable	is connected between the robot foot (R1.MP) and the control cabinet (XS1).
The robot's measurement cable	is connected between the serial measurement box (R1.SMB) and the control cabinet (XS2).
The robot cabinet's cable to MS2	is connected inside the robot's control cabinet. It connects MS2 from the rear face inside the cabinet to the left side of the cabinet.



Several external axes

## Electrical installation

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### Several external axes

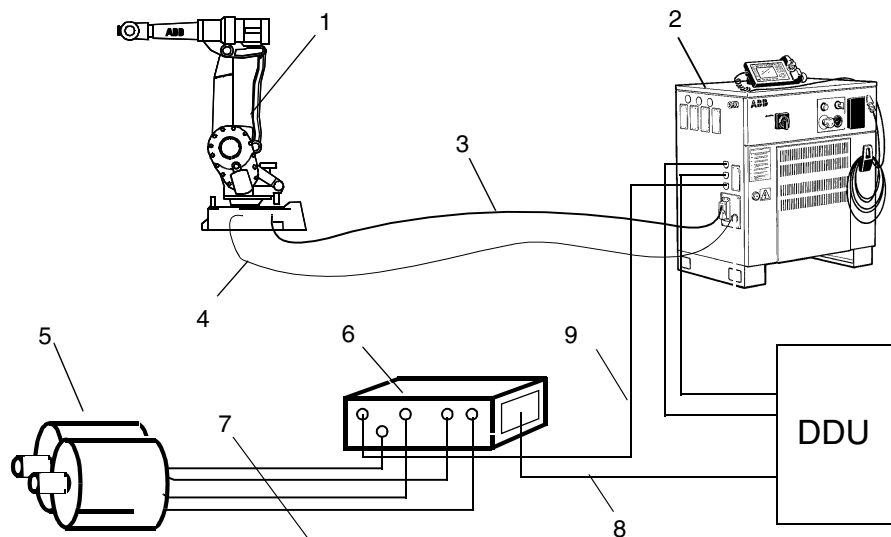
Part	Name
1	Robot
2	Control cabinet S4c
3	The robot's motor cable (supplied together with the robot)
4	The robot's serial measurement cable (supplied together with the robot)
5	Motors
6	Serial Measurement Box
7	Motor cables
8	Resolver cables
9	Motor cable for several motors
10	Serial measurement cable, external axis
11	The robot's cable to the cabinet for MS2

### 3.6 High voltage motors

#### 3.6.1 Installation into one cabinet for IRB 6600/7600

Connect the motor units as follows:

Cable	Connections
The external axis' serial measurement cable	is connected between the serial measurement box (SMB.1) and the control cabinet (XS41).
The resolver cable	is connected between the serial measurement box (FB.MX) and the motors.
The motor cable	is connected between the serial measurement box (MP.MX) and the motors.
The external axis' motor cable	is connected between the serial measurement box (MP.JB1) and DDU cabinet (XS7X).
The robot's motor cable	is connected between the robot foot (R1.MP) and the control cabinet (XS1).
The robot's measurement cable	is connected between the serial measurement box (R1.SMB) and the control cabinet (XS2).



Several external axes

Part	Name
1	Robot
2	Control cabinet S4c
3	The robot's motor cable (supplied together with the robot)
4	The robot's serial measurement cable (supplied together with the robot)

## Electrical installation

---

Several external axes

Part	Name
5	Motors
6	Serial Measurement Box
7	Motor cables
8	Motor cabling, (external axes)
9	Serial measurement cable, (external axes)

## 4 Order information

### 4.1 Introduction

#### 4.1.1 General

With delivery of the motor unit comes a diskette with the basic setup of the system parameters. All part numbers below refer to robots with S4C and S4C plus control. For systems with several external axes or where a length of resolver and power cables other than 5 m is required, all units should be ordered separately. Important to state control system with order (S4, S4C or S4C plus).

#### 4.1.2 Ordering cables

When ordering cables, the -xx in the item number should be replaced by the length code, which is specified in the tables for the various cable types.

**The robot must be equipped with drive units for external axes. Motor Small requires a G or T type drive unit. Motor Medium and Motor Large require a T type drive unit. For a description of the drive units, please refer to the description of the robot itself. A V drive unit can be used for Motor Large.**

## G Motor unit (low voltage)

### 4.2 One motor

#### 4.2.1 Motors and gearboxes

Part number	Motor	Gearbox
3HXD 1000-111	Motor Small	
3HXD 1000-112	Motor Medium	
2334 0001-14		Gearbox 9:1 (Medium)
3HXD 0100-80	Motor Large	
2334 0001-16		Gearbox 31:1 (Large)
2334 0001-17		Gearbox 16:1 (Large)
3HXD 0100-362	Motor X-Large	

## Order information

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Motor unit (low voltage)

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### 4.2.2 Serial Measurement Box (SMB)

Part number	Serial Measurement Box
3HXD 0100-89	SMB for one motor

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### 4.2.3 Cables between the SMB and motor

Part number	Cable	Length
3HXD 1161-xx	Resolver cable	
3HXD 1163-xx	Motor cable	
	-15	1.5 m
	-30	3 m
	-50	5 m
	-70	7 m
	-150	15 m

---

### 4.2.4 Cable for external axis from the robot cabinet to SMB

Part number	Cable	Length
3HXD 1168-xx	Serial measurement cable for external axis	
	-30	3 m
	-50	5 m
	-70	7 m
	-150	15 m

---

### 4.2.5 Cable for external axis from SMB to robot

Part number	Cable	Length
3HXD 1137-xx	Serial measurement cable for external axis	
	-30	3 m
	-50	5 m
	-70	7 m
	-150	15 m

---

## 4.3 Two to six motors

### 4.3.1 Motors and gearboxes

Part number	Motor	Gearbox
3HXD 1000-111	Motor Small	
3HXD 1000-112	Motor Medium	
2334 0001-14		Gearbox 9.326:1 (Medium)
3HXD 0100-80	Motor Large	
2334 0001-16		Gearbox 31.15:1 (Large)
2334 0001-17		Gearbox 15.75:1 (Large)
	Motor X-Large	
		Gearbox

### 4.3.2 Serial measurement boxes (SMB)

Part number	Serial Measurement Box
3HXD 0100-90	SMB for two motors
3HXD 0100-92	SMB for up to four motors
3HXD 0100-93	SMB for up to six motors

### 4.3.3 Cables (SMB-motor)

Part number	Cable	Length
3HXD 1161-xx	Resolver cable	
3HXD 1163-xx	Motor cable	
	-15	1.5 m
	-30	3 m
	-50	5 m
	-70	7 m
	-150	15 m

## Order information

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Motor unit (high voltage)

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### 4.3.4 Cables for external axes and several motors (cabinet-SMB)

Part number	Cable	Length
3HXD 1278-xx	Motor cable for external axes and several motors	
3HXD 1137-xx	Serial measurement cable for external axes	
	-30	3 m
	-50	5 m
	-70	7 m
	-150	15 m

---

### 4.3.5 Robot cabinet cable for MS2

Cable	Remarks
3HXD 0100-117	Robot cabinet cable for MS2 (connects MS2 from the rear face inside the cabinet to the left side of the cabinet.) MS2 is used if more than 1 external axis is connected to S4C or S4C plus robot control system. MS2 is not required if an external axis cabinet is connected to the robot.

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## H Motor unit (high voltage)

### 4.4 One or two motors

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#### 4.4.1 Motors and gearboxes

Part number	Motor	Gearbox
3HXD 0100-356	Motor Medium	
3HXG 1141-1		Gearbox 28:1 (Medium)
3HXD 0100-355	Motor Large	
3HXG 1141-2		Gearbox 35:1 (Large)

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**4.4.2 Serial Measurement Box (SMB)**

Part number	Serial Measurement Box
3HXD 1616-1	SMB for one motor
3HXD 1616-2	SMB for two motors

**4.4.3 Brake release box (BRB) for one motor**

Part number	Brake release box
3HXD 0100-363	BRB for one motor

**4.4.4 Cable between SMB and motor**

Two cables for two motors

Part number	Cable	Length
3HXD 1615-xx	Motor/resolver cable	
-15		1.5 m
-30		3 m
-50		5 m
-70		7 m
-150		15 m

**4.4.5 Cable between DDU cabinet and BRB/SMB for one motor**

Part number	Cable	Length
3HXD 1601-xx	Cable for external axis	
-70		7 m
-150		15 m
-220		22 m

## Order information

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Motor unit (high voltage)

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### 4.4.6 Cable between DDU cabinet and SMB for two motors

For one or two motors

Part number	Cable	Length
3HXD 1619-xx	Cable for external axis	
-70		7 m
-150		15 m
-220		22 m

---

### 4.4.7 Cable between robot cabinet and SMB for one or two motors

Part number	Cable	Length
3HXD 1618-xx	Serial measurement cable for external axis	
-70		7 m
-150		15 m
-220		22 m

---

### 4.4.8 Cable between robot and BRB

Part number	Cable	Length
3HXD 1640-xx	Resolver cable for external axis	
-15		1.5 m
-30		3 m
-50		5 m
-70		7 m
-150		15 m
-220		22 m

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**4.5 Notes:**

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## Order information

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Motor unit (high voltage)



