ROBOTICS

Product specification

IRP

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Product specification

IRP A-250/500/750
IRP B-250/500/750
IRP C-500/1000
IRP K-300/600/1000
IRP L-300/600/1000/2000/5000
IRP R-300/600/1000

OmniCore

Document ID: 3HAC088965-001

Revision: B

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Original instructions.

Table of contents

Overview of this product specification

About this product specification

It describes the performance of the different positioners in terms of:

- The structure and dimensional prints
- The fulfilment of standards, safety and operating requirements
- The load diagrams, mounting of additional equipment, the motion and reach
- Customer connections
- The specification of variants and options available
- Control equipment
- Safety system

Usage

Product specifications are used to find data and performance about the product, for example to decide which product to buy. How to handle the product is described in the product manual.

Users

It is intended for:

- Product managers and product personnel
- Sales and marketing personnel
- Order and customer service personnel

References

Reference	Document ID
Product specification - OmniCore V line	*3HAC074671-001*
Product manual - Product.ProductName	*3HAC088963-001*
Product specification - Robot user documentation, OmniCore with RobotWare 7	*3HAC065042-001*

Revisions

Revision	Description
A	First edition.
B	Published in release 24D. The following updates are done in this revision: • Added information about requirements on controller options, see *Positioner type on page 134*. • Minor corrections.

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1 Description

1.1 Structure

1.1.1 Introduction

General

IRP positioners are designed to handle work pieces of a weight between 250 and 5000 kg (including fixture) in connection with robot applications. The use of the positioners offers one work piece set up for all operations, less floor space, less fixtures, and higher production capacity and quality.

The modular design, few and heavy-duty moving parts as well as minimal maintenance demands make the positioners service friendly.

Operating system

The IRP is equipped with the controller V250XT and V400XT and robot control software, RobotWare. RobotWare supports every aspect of the robot system, such as motion control, development and execution of application programs, communication etc. See *Product specification - OmniCore V line*.

Safety

The applicable safety standards are valid for the complete robot, that is, manipulator, IRP, and controller.

Additional functionality

For additional functionality, the robot can be equipped with optional software for application support - for example gluing and welding, network communication features, and advanced functions such as multitasking, sensor control etc. For a complete description on optional software, see *Product specification - OmniCore V line*.

Limitations

- Cannot be combined with add on Motor Units.
- No safety options are available with OmniCore.
- Orange color cannot be selected with OmniCore.

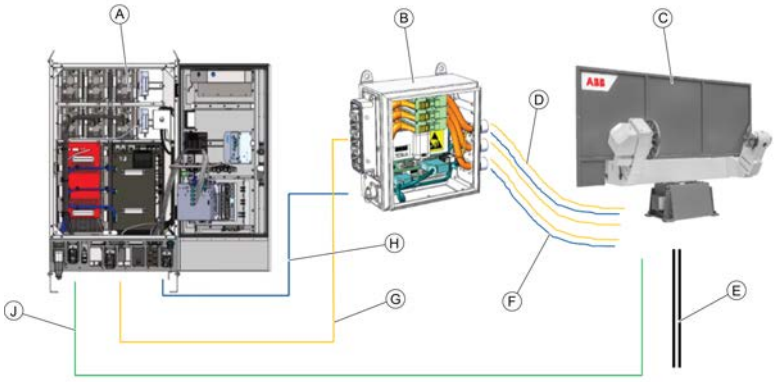
1.1.2 Structure

System overview

The function package IRP consists of the following units:

- The positioner(s) with one or two operator stations
- Robot(s) with process equipment for e.g. arc welding
- Control cabinet, OmniCore
- Motor connection box (MCB)

Robot system



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Position	Description
A	V250XT/V400XT Controller, with external drives
B	MCB (3 or 6 axis)
C	IRP or MU/GU
D	Motor power and brake
E	Weld return cable
F	Resolver
G	ADU Motor power and brake
H	SMB link
J	CP/CS - option

Cable lengths

The length of the motor power and brake cable (D) and the resolver cable (F) is fixed, which means other lengths cannot be ordered.

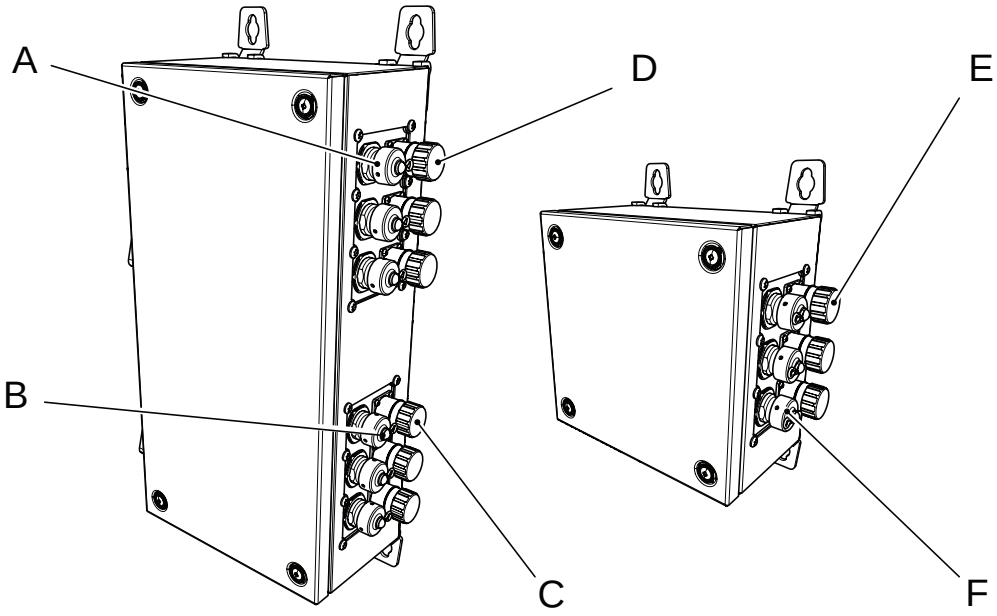
- 2 meters for B, C, R, and K positioners
- 3 meters for A and L positioners

Note

The MCB must be installed in close to the IRP.

1.2 Positioner interface to MCB

Interface for positioner



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Pos	Description
A	Resolver connector axis 1-3 (6 axis version)
B	Resolver connector axis 4-6 (6 axis version)
C	Power connector axis 1-3 (6 axis version)
D	Power connector axis 4-6 (6 axis version)
E	Power connector axis 1-3 (3 axis version)
F	Resolver connector axis 1-3 (3 axis version)

Note

The MCB must be installed in close to the IRP.

1.3 Installation

1.3.1 Installation

General

The IRP's are intended for floor mounting and requires a good foundation and/or a concrete floor with strength according to standard C20/25 or better according to ENV 206. If necessary, use shims under the foundation of the positioner to avoid alignment problem.

The bolts can be either anchor or chemical type.

For more detailed information regarding installation please see Product Manual for the positioner.

1.4 Applicable standards

General

The product is compliant with ISO 10218-1:2011, *Robots for industrial environments - Safety requirements - Part 1 Robots*, and applicable parts in the normative references, as referred to from ISO 10218-1:2011. In case of deviation from ISO 10218-1:2011, these are listed in the declaration of incorporation. The declaration of incorporation is part of the delivery.

Robot standards

Standard	Description
ISO 9283	Manipulating industrial robots – Performance criteria and related test methods
ISO 9787	Robots and robotic devices – Coordinate systems and motion nomenclatures
ISO 9946	Manipulating industrial robots – Presentation of characteristics

Other standards used in design

Standard	Description
IEC 60204-1	Safety of machinery - Electrical equipment of machines - Part 1: General requirements, normative reference from ISO 10218-1
IEC 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity standard for industrial environments
IEC 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
ISO 13849-1:2006	Safety of machinery - Safety related parts of control systems - Part 1: General principles for design, normative reference from ISO 10218-1
UL 1740 (option) CSA Z434 (option)	Standards For Safety - Robots and Robotic Equipment Industrial robots and robot Systems - General safety requirements Valid for USA and Canada.

1.5 Maintenance and troubleshooting

1.5.1 Introduction

General

The Positioners require only minimum maintenance during operation. They have been designed to make it as easy to service as possible:

- Maintenance-free AC motor is used.
- Oil is used for the gear boxes.
- The cabling is routed for longevity, and in the unlikely event of a failure, its modular design makes it easy to change.

Maintenance

The maintenance intervals depend on the use of the positioner. For detailed information on maintenance procedures, see Maintenance section in the Product Manual.

2 Technical data

2.1 IRP A-250/500-750

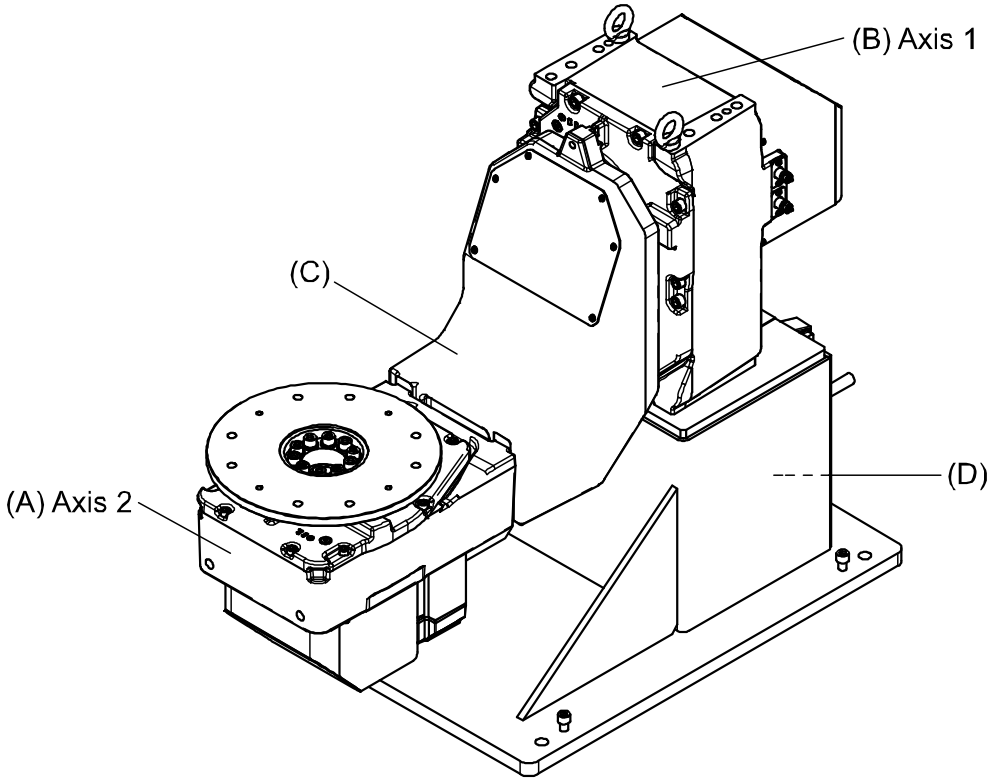
2.1.1 General

Introduction

The positioner is designed to handle workpieces of a weight up to 250/500/750 kg (including the fixture) in connection with robot processes.

The modular design, few and heavy-duty moving parts as well as minimal maintenance demands make the positioner service friendly.

The positioner is designed with the following main sections (Figure below)



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Pos	Description	Pos	Description
A	Rotary unit, PLATE	D	Stand
B	Rotary unit, ARM	E	SMB unit
C	Arm		

There is a rotary unit (B, ARM) fitted on the stand (D).

On (B) outgoing shaft there is an arm (C) which on its end there is a rotary unit (A) fitted.

On the outgoing shaft of the rotary unit (A, PLATE) a faceplate is fitted. The faceplate has plain holes and guide holes for securing fixtures.

Continues on next page

2.1.1 General
Continued

The rotary unit is fitted with a current collector in the form of a slip ring in order to transfer weld current.

2.1.2 Technical data

General

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP A-250		IRP A-500		IRP A-750	
	ARM	PLATE	ARM	PLATE	ARM	PLATE
Max. handling capacity	250 kg		500 kg		750 kg	
Max continuous torque	350 Nm		650 Nm		900 Nm	
Center of gravity	See loading table		See loading table		See loading table	
Positioning time 90 degrees	0.9 -1.3 s	0.8 -1.2 s	1.2 -2.2 s	0.9 -1.3 s	1.2 -2.2 s	0.9 -1.3 s
Positioning time 180 degrees	1.5 -2.1 s	1.3 -2.0 s	2.2 -3.5 s	1.5 -2.1 s	2.2 -3.5 s	1.5 -2.1 s
Positioning time 360 degrees	2.7 -2.9 s	2.3 -2.7 s	4.2 -4.9 s	2.7 -2.9 s	4.2 -4.9 s	2.7 -2.9 s
Working area	ARM = ± 181º PLATE = Infinite		ARM = ± 181º PLATE = Infinite		ARM = ± 181º PLATE = Infinite	
Repetition accuracy with equal loads at radius 500 mm	±0.05 mm		±0.05 mm		±0.05 mm	
Max. speed of rotation	150 deg/s	180 deg/s	90 deg/s	150 deg/s	90 deg/s	150 deg/s
Max welding power, 60% duty cycle	600 Amp		600 Amp		600 Amp	
Weight	470 kg		850 - 870 kg		850 - 870 kg	

2.1.3 Loading table

General

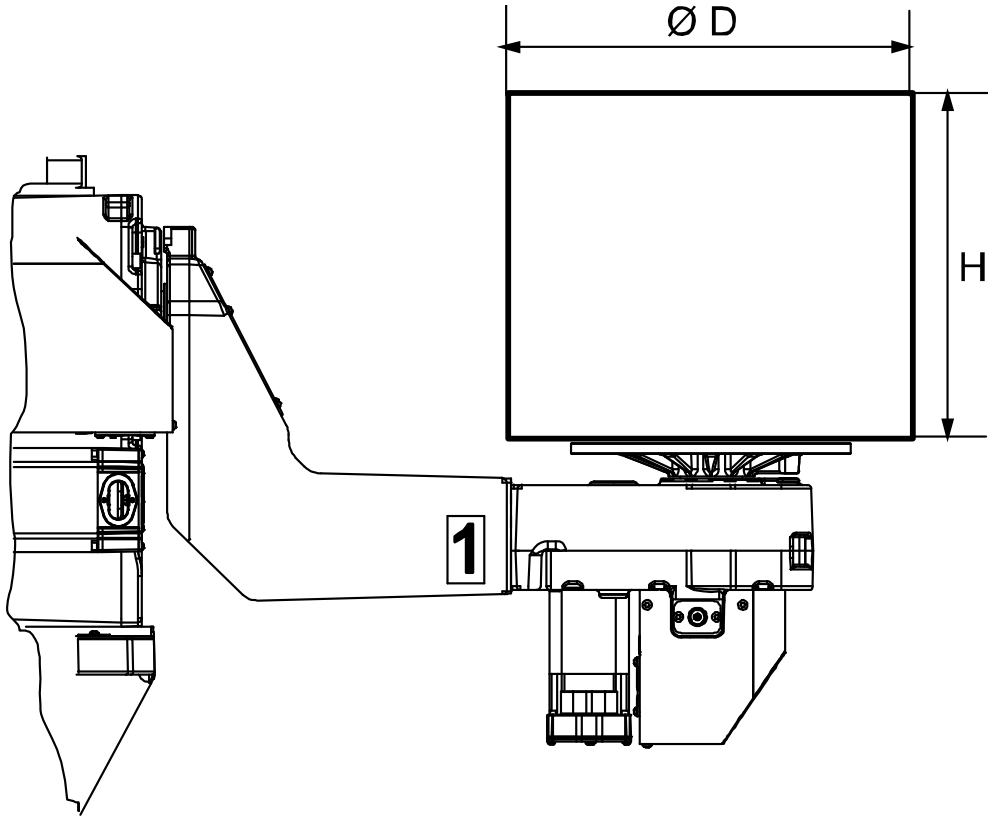
The tables show the maximum permitted center of gravity displacement from the center of rotation and the rotary unit's faceplate at different loads.

IRP A-250

If the load is 225 kg the center of gravity must be within the area limited by the measurement ØD respective measurement H (317 mm respective 294 mm), see Figure Below

If the load is 235 kg use the column immediately above, that is the 250 kg column.

ØD (mm)	285	317	357	408	476	571	714	951
H (mm)	265	294	331	379	442	530	663	883
Weight of the workpiece including fixture (kg)	250	225	200	175	150	125	100	75



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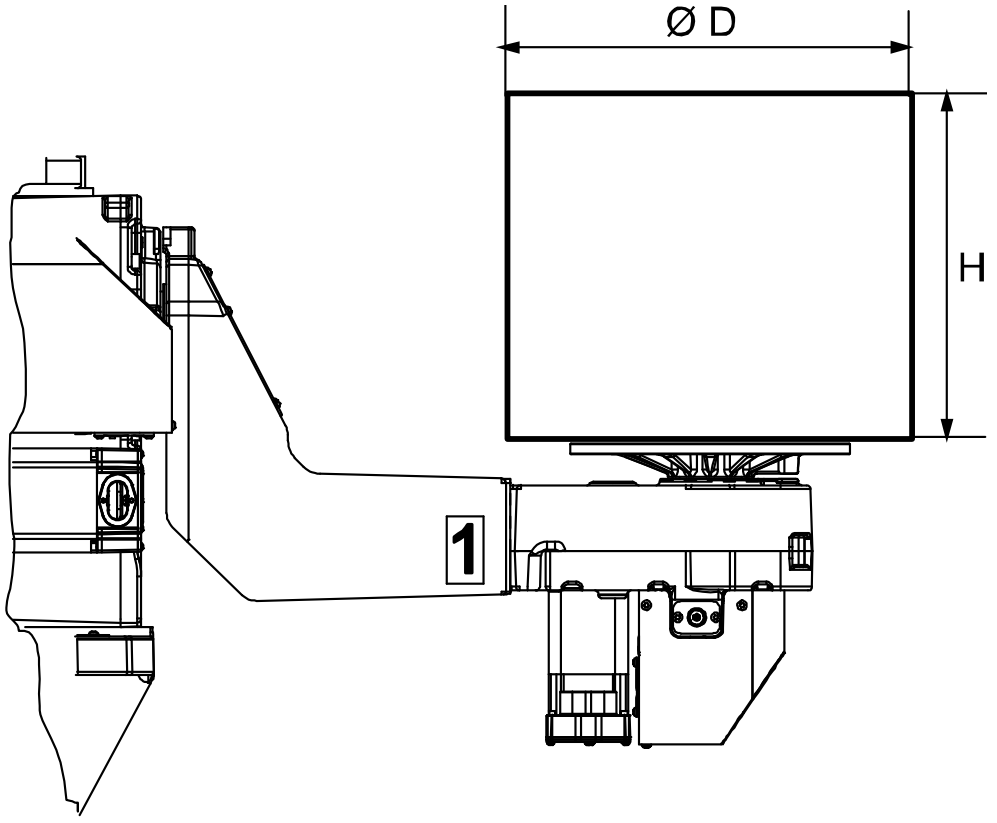
IRP A-500

If the load is 450 kg the center of gravity must be within the area limited by the measurement ØD respective measurement H (294 mm respective 748 mm), see Figure below.

If the load is 435 kg use the column immediately above, that is the 450 kg column.

Weight of the workpiece including fixture (kg)	500	450	400	350	300	250	200	150
ØD (mm)	265	294	331	379	442	530	663	888
H (mm)	673	748	841	950	950	950	950	950



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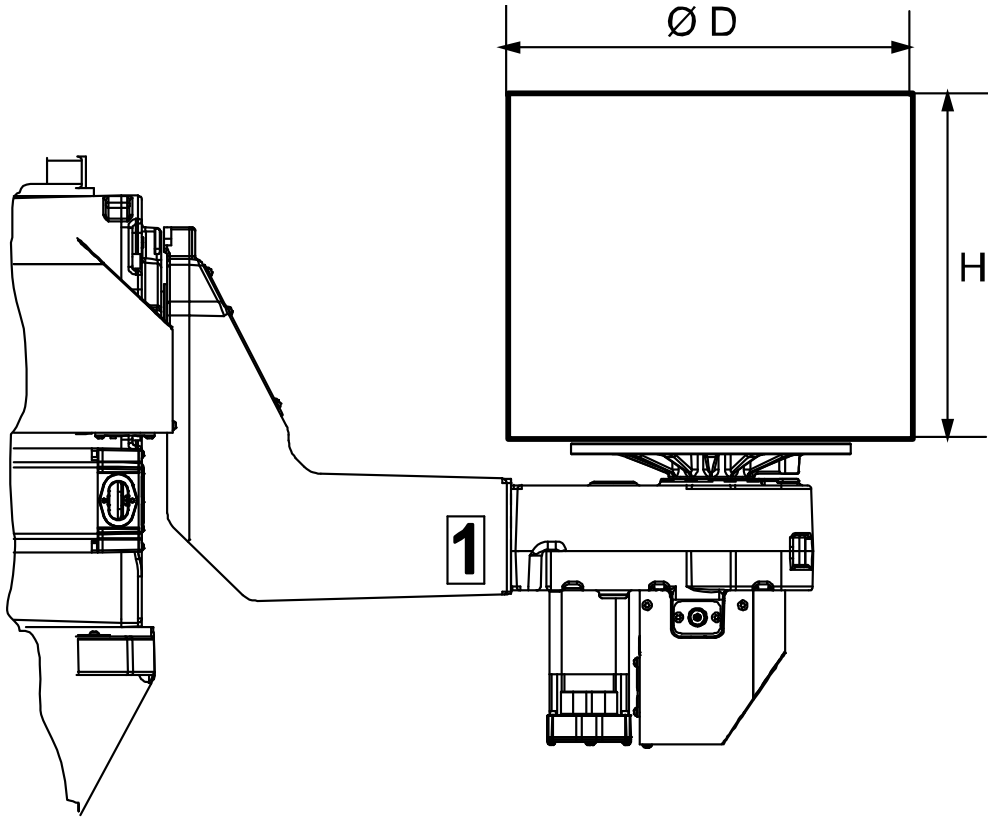
2.1.3 Loading table
Continued

IRP A-750

If the load is 700 kg the center of gravity must be within the area limited by the measurement ØD respective measurement H (262 mm respective 728 mm), see Figure below.

If the load is 685 kg use the column immediately above, that is the 700 kg column.

Weight of the workpiece including fixture (kg)	750	700	650	600	550	500	450	400
ØD (mm)	245	262	282	306	334	367	408	459
H (mm)	680	728	784	849	927	950	950	950



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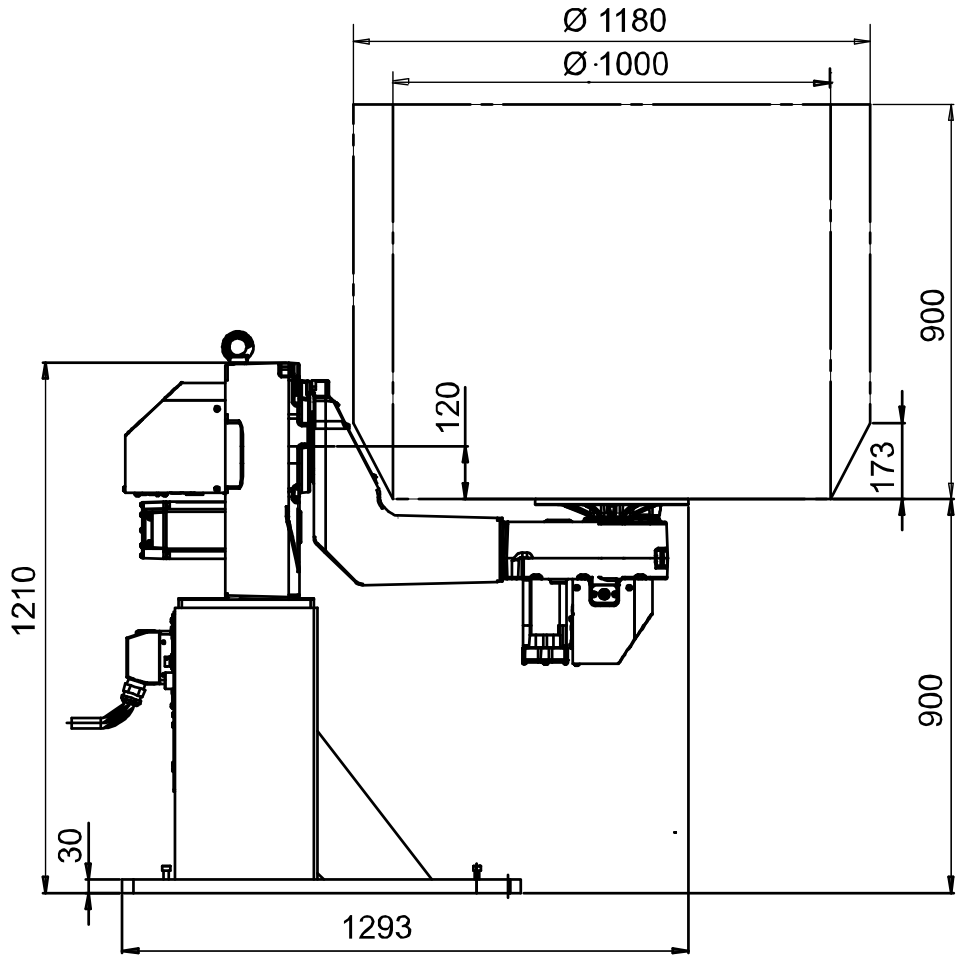
2.1.4 Dimensional drawings

IRP A-250



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2.1.4 Dimensional drawings

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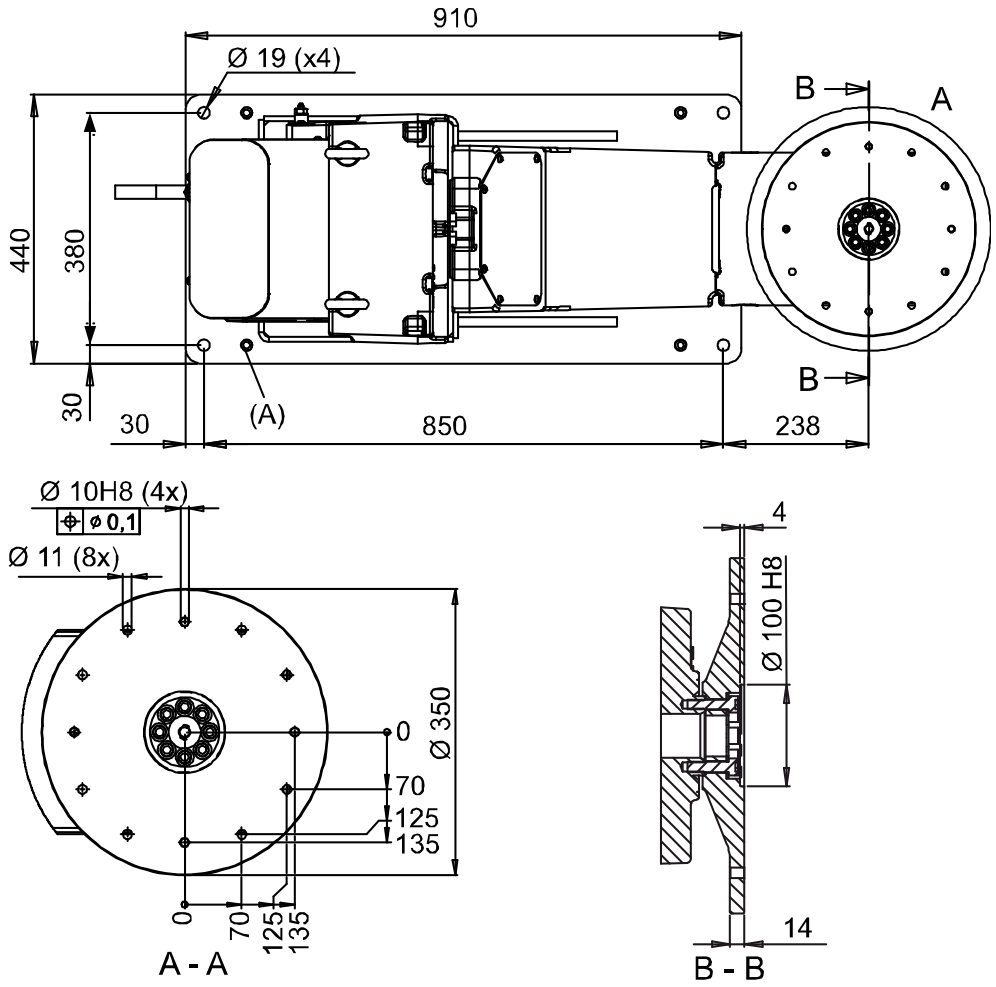

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Pos	Description
A	Adjusting bolts

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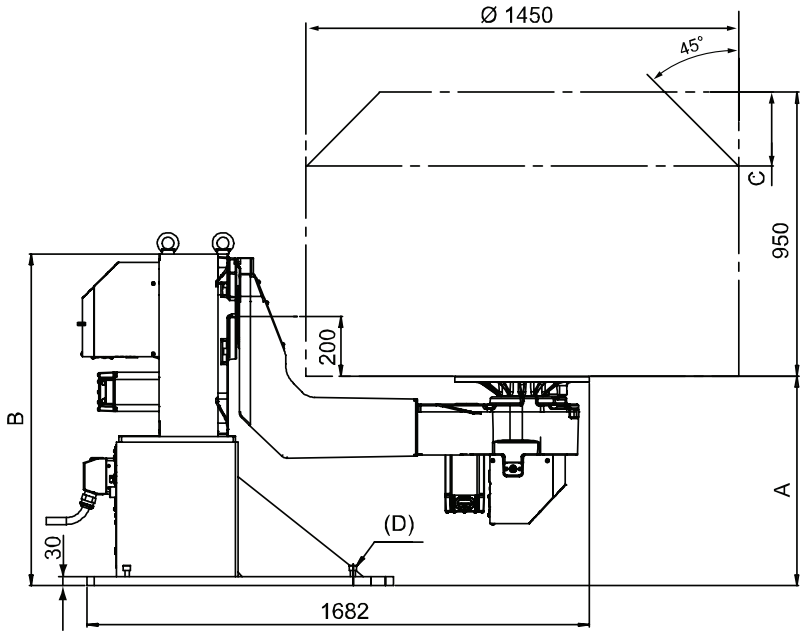
IRP A-500 / -750 Ø1450 mm



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Pos	Description
D	Adjusting bolts

IRP A-500 / -750 Ø1450		
A (mm)	B (mm)	C (mm)
700	1110	250
800	1210	0
900	1310	0

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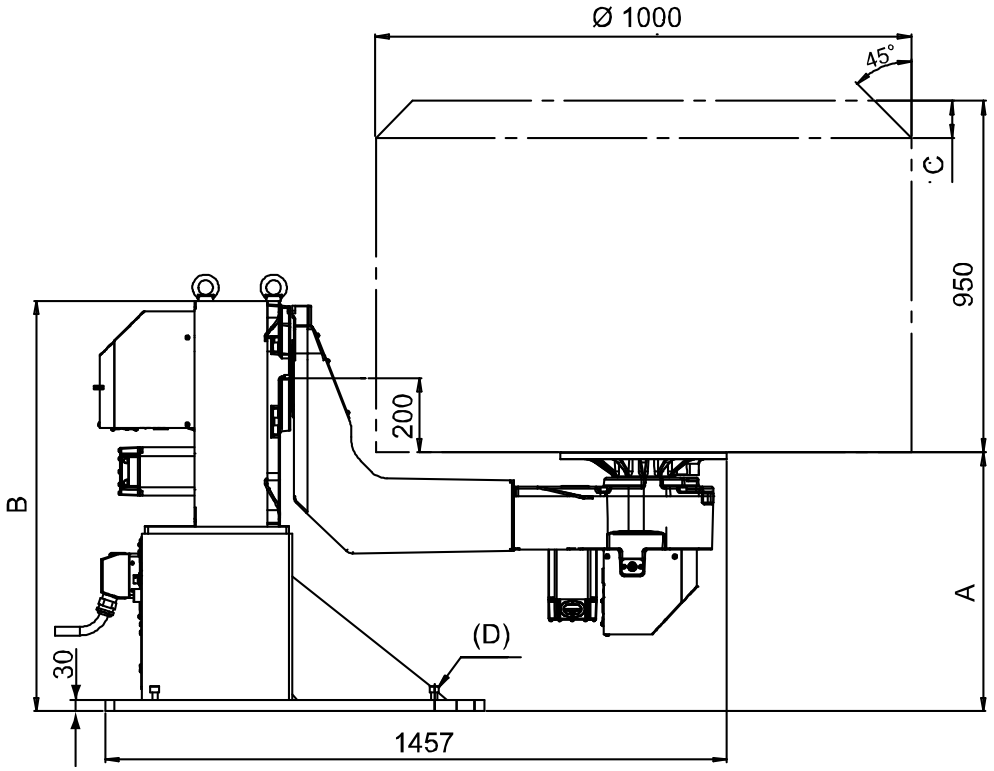
2.1.4 Dimensional drawings
Continued

IRP A-500 / -750 Ø1000 mm



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Pos	Description
D	Adjusting bolts

IRP A-500 / -750 Ø1000		
A (mm)	B (mm)	C (mm)
700	1110	100
800	1210	0
900	1310	0

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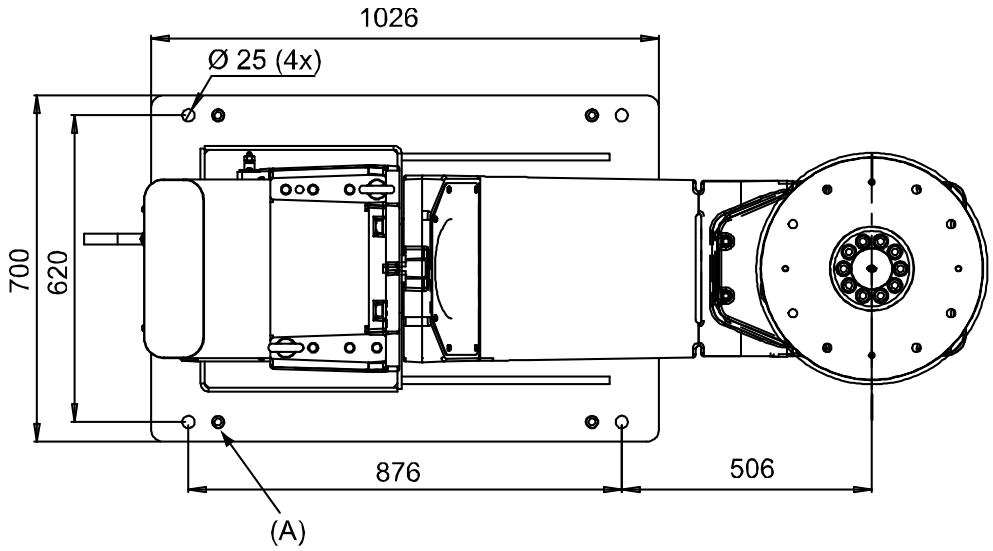
IRP A-500 / -750 Ø1450 mm



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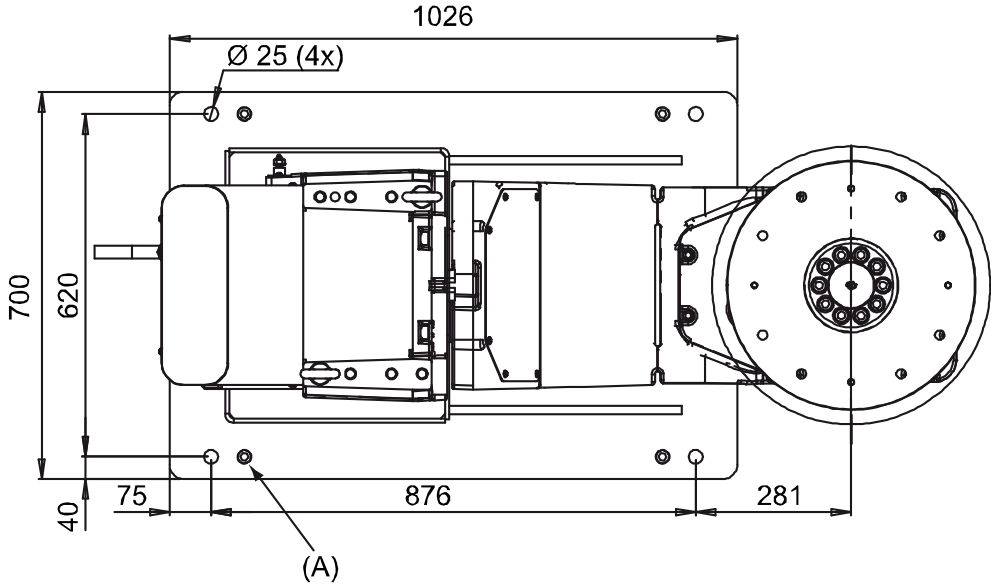
IRP A-500 / -750 Ø1000 mm



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Pos	Description
A	Adjusting bolts

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2.1.4 Dimensional drawings

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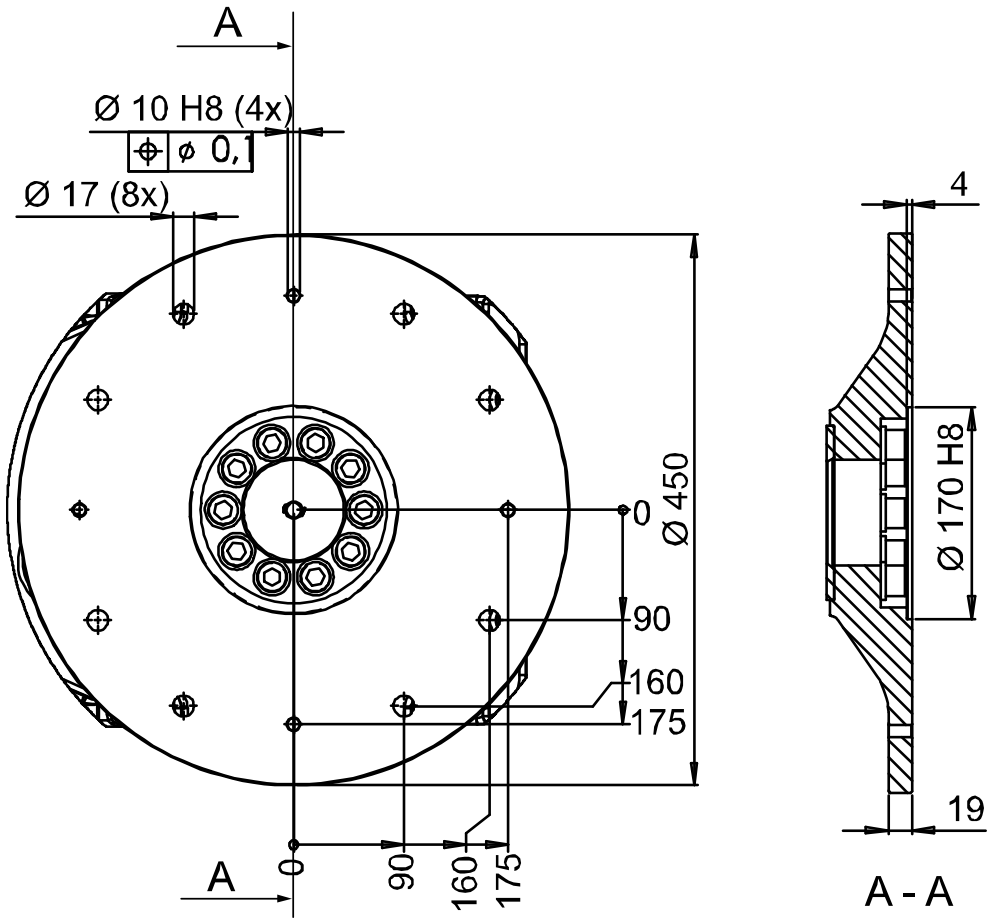

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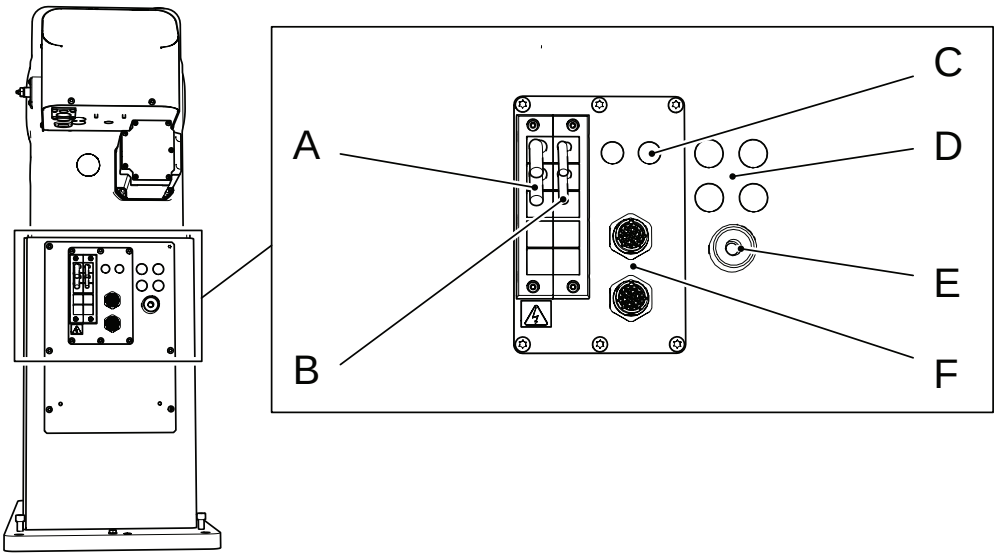
Connections



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Pos	Description	Pos	Description
A	Power, axis 1-2	D	Air (option)
B	Resolver signal, axis 1-2	E	Weld return cable
C	Profibus (option)	F	Customer power (option)

2.2 IRP B-250/500/750

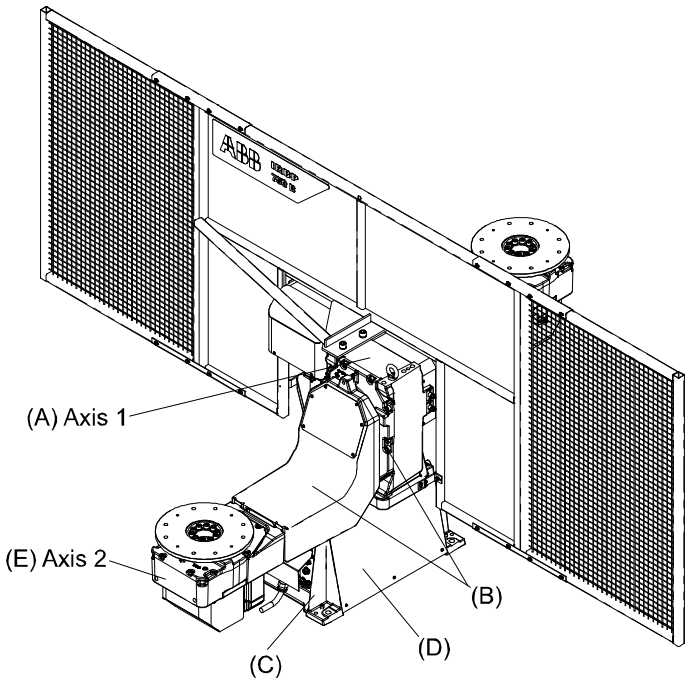
2.2.1 General

Introduction

The positioner is designed to handle workpieces of a weight up to 250/500/750 kg (incl. the fixture) in connection with robot processes.

The positioner features a twin station solution where the robot works on one side and the operator loads and unloads on the other.The modular design, few and heavy-duty moving parts as well as minimal maintenance demands make the positioner service friendly.

The positioner is designed with the following main sections (Figure below).



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Pos	Description	Pos	Description
A	Rotary unit, ARM	D	SMB unit
B	Stand	E	Rotary unit, PLATE
C	Station interchange unit, IN-TERCH		

On the outgoing shaft of the station interchange unit, there is a frame on which two rotary units are fitted.

On the outgoing shaft (A, ARM) there is an arm fitted, with a rotary unit mounted.

On the outgoing shaft of the rotary unit (E, PLATE) a faceplate is fitted. The faceplate has plain holes and guide holes for securing fixtures.

A screen is fitted between the two stations, which protects the operator from arc-eye.

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The rotary unit is fitted with a current collector in the form of a slip ring in order to transfer weld current.

2.2.2 Technical data

General

Note

Max speed specified in the table below only applies to standard products.

Technical data	IRP B-250		IRP B-500		IRP B-750	
	ARM	PLATE	ARM	PLATE	ARM	PLATE
Max. handling capacity	250 kg		500 kg		750 kg	
Max load difference between sides 1 and 2 at operation	125 kg		250 kg		250 kg	
Max. load difference between sides 1 and 2 at standstill	250 kg		500 kg		750 kg	
Center of gravity	See *Loading table on page 31*		See *Loading table on page 31*		See *Loading table on page 31*	
Positioning time 90 degrees	0.9-1.3 s	0.8-1.2 s	1.2-2.2 s	0.9-1.3 s	1.2-2.2 s	0.9-1.3 s
Positioning time 180 degrees	1.5-2.1 s	1.3-2.0 s	2.2-3.5 s	1.5-2.1 s	2.2-3.5 s	1.5-2.1 s
Positioning time 360 degrees	2.7-2.9 s	2.3-2.7 s	4.2-4.9 s	2.7-2.9 s	4.2-4.9 s	2.7-2.95 s
Working area	INTERCH = ± 181º ARM = ± 181º PLATE = Infinite		INTERCH = ± 181º ARM = ± 181º PLATE = Infinite		INTERCH = ± 181º ARM = ± 181º PLATE= Infinite	
Repetition accuracy with equal loads at radius 500 mm	±0.05 mm		±0.05 mm		±0.05 mm	
Max. speed of rotation	150 deg/s	180 deg/s	90 deg/s	150 deg/s	90 deg/s	150 deg/s
Index time	3.4-3.7 s		3.7-4.4 s		3.7-4.4 s	
Weld to weld time	5.2-5.6 s		5.8-6.5 s		5.8-6.5 s	
Max welding current, 60% duty cycle	600 Amp		600 Amp		600 Amp	
Weight	915 kg		1,750 kg		1,750 kg	

2.2.3 Loading table

General

The tables shows max. permitted center of gravity shift from the rotation center and the rotary unit's faceplate at different loads.

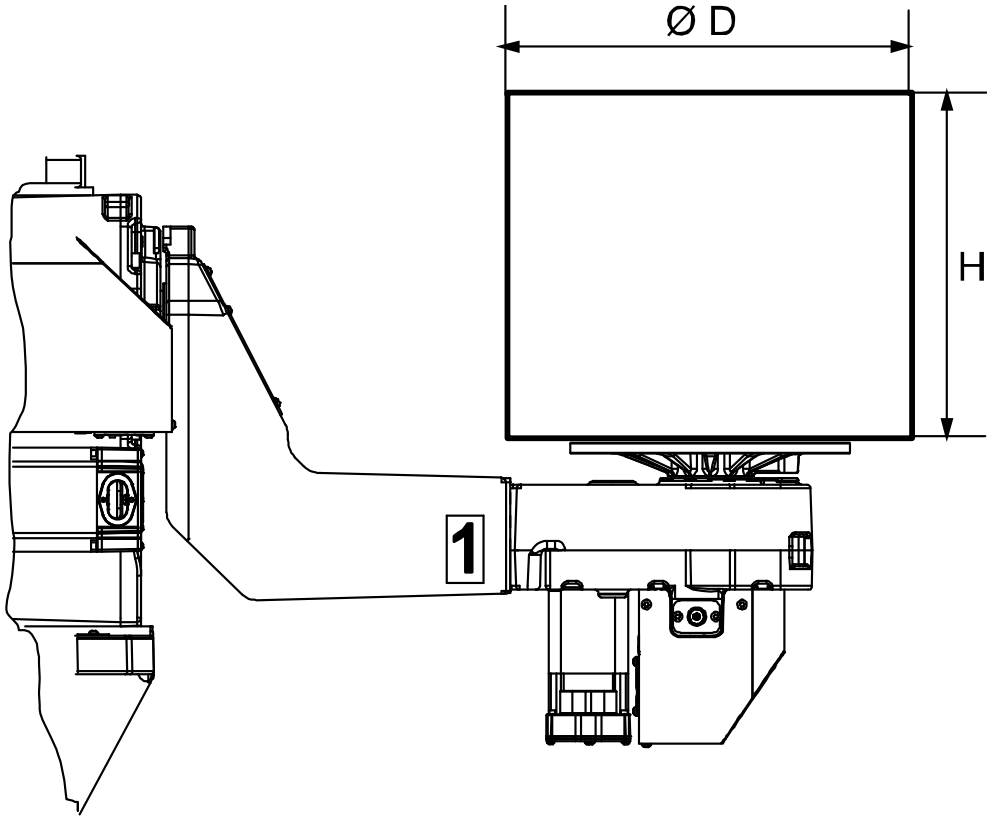
IRP B-250

If the load is 225 kg, the center of gravity must be located within the area ØD and H (ØD=317 mm, H= 294 mm), see Figure below.

If the load is 235 kg, see the column for 250 kg load.

The maximum load difference at stationary is the handling capacity, as long as the positioner is standing still.

Weight of the workpiece including fixture (kg)	250	225	200	175	150	125	100	75
ØD (mm)	285	317	357	408	476	571	714	951
H (mm)	265	294	331	379	442	530	663	883



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2.2.3 Loading table
Continued

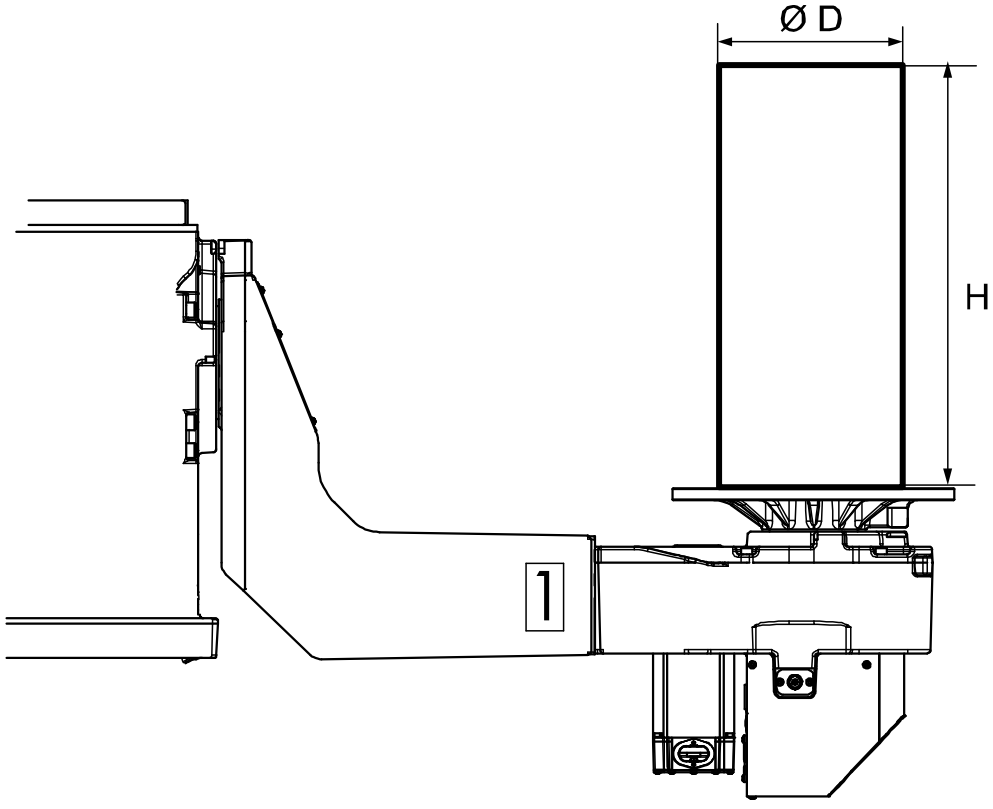
IRP B-500

If the load is 450 kg, the center of gravity must be located within the area ØD and H (ØD=294 mm, H= 748 mm), see Figure below.

If the load is 435 kg, see the column for 450 kg load.

The maximum load difference at stationary is the handling capacity, as long as the positioner is standing still.

Weight of the workpiece including fixture (kg)	500	450	400	350	300	250	200	150
ØD (mm)	265	294	331	379	442	530	663	888
H (mm)	673	748	841	950	950	950	950	950



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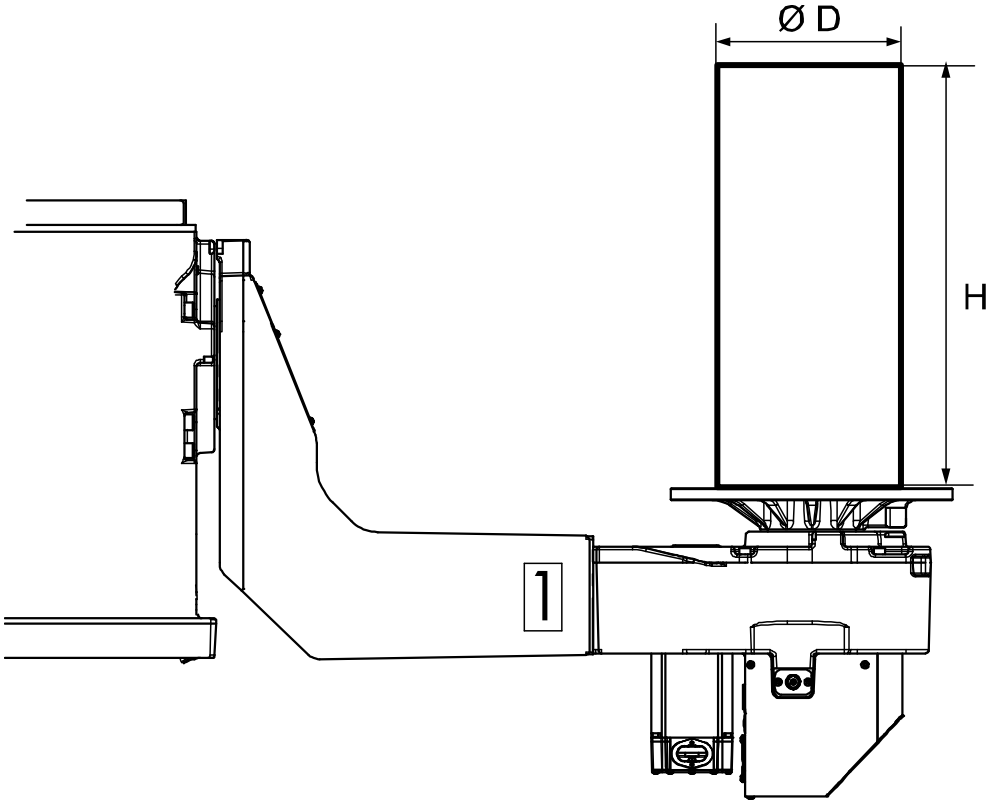
IRP B-750

If the load is 700 kg, the center of gravity must be located within the area ØD and H, (ØD=262 mm, H= 728 mm), see Figure below.

If the load is 685 kg, see the column for 700 kg load.

The maximum load difference at stationary is the handling capacity, as long as the positioner is standing still.

Weight of the workpiece including fixture (kg)	750	700	650	600	550	500	450	400
ØD (mm)	245	262	282	306	334	367	408	459
H (mm)	680	728	784	849	927	950	950	950



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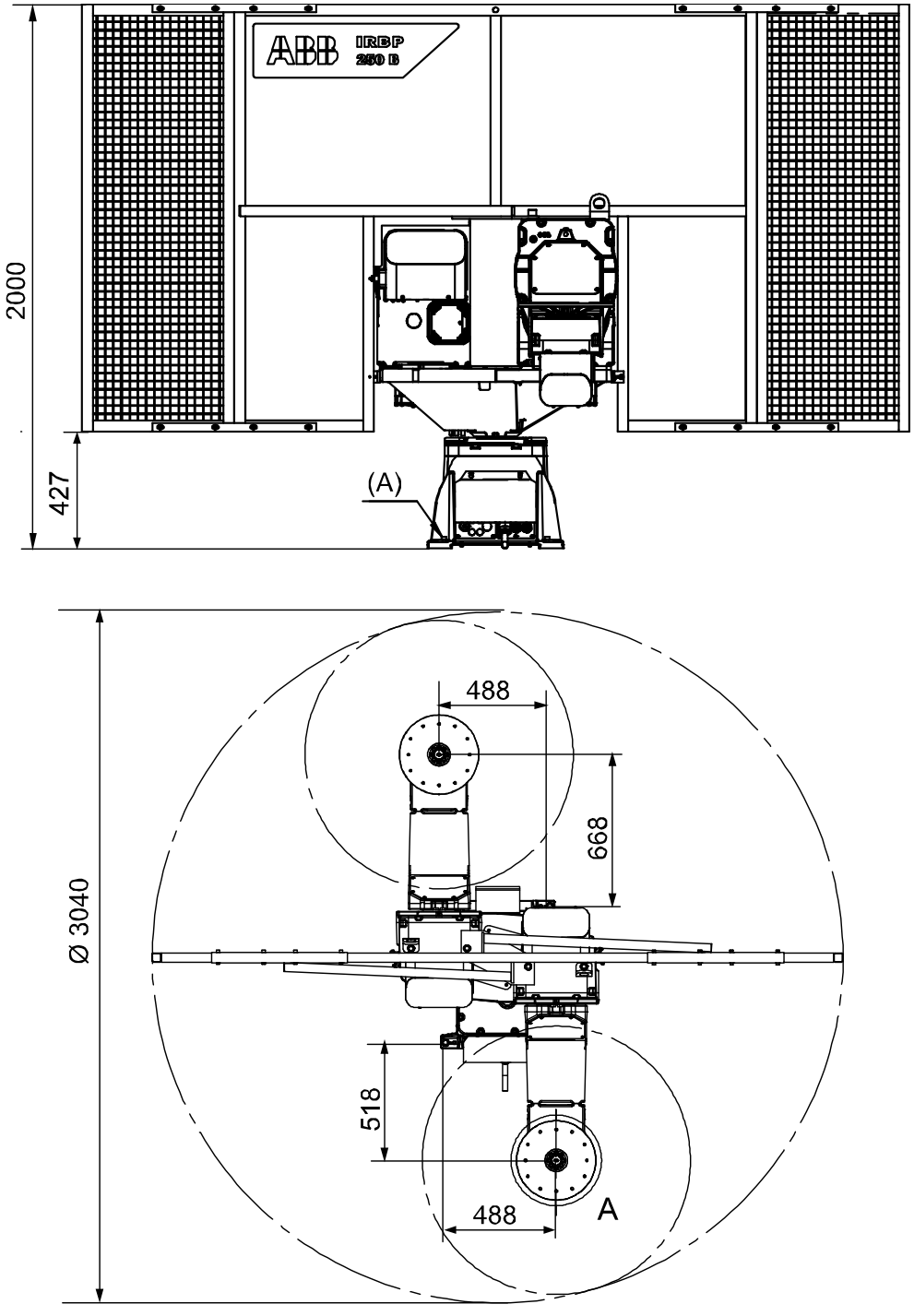
2.2.4 Dimensional drawings

IRP B-250



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Pos	Description
A	Adjusting bolts

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2.2.4 Dimensional drawings
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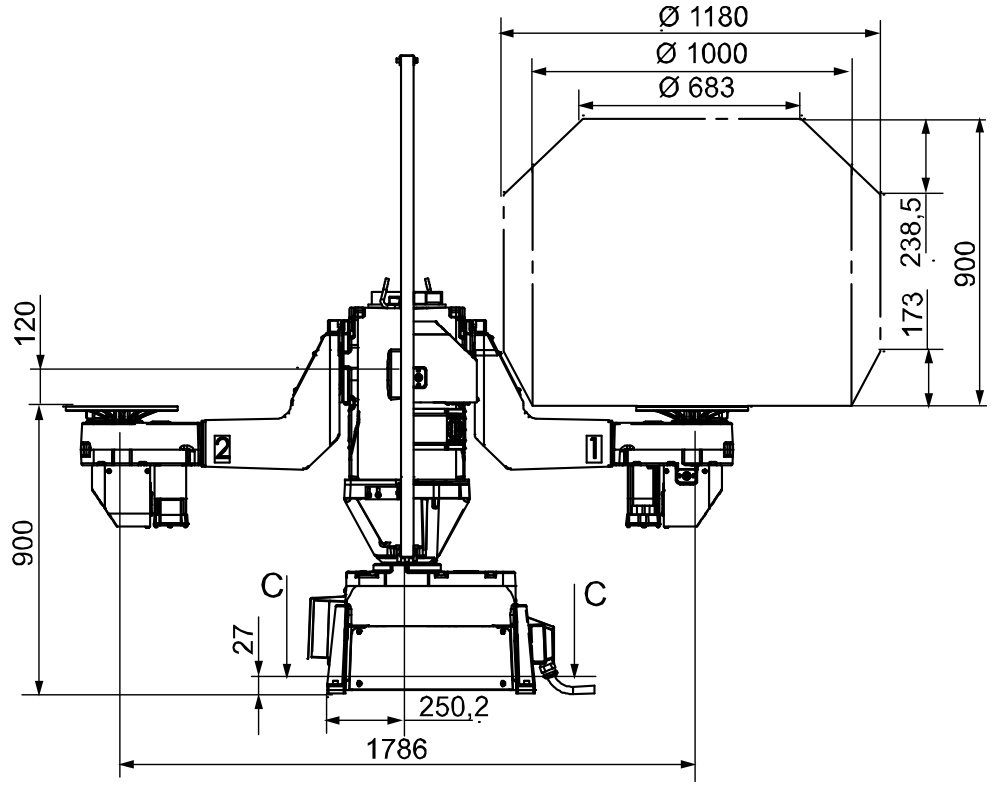

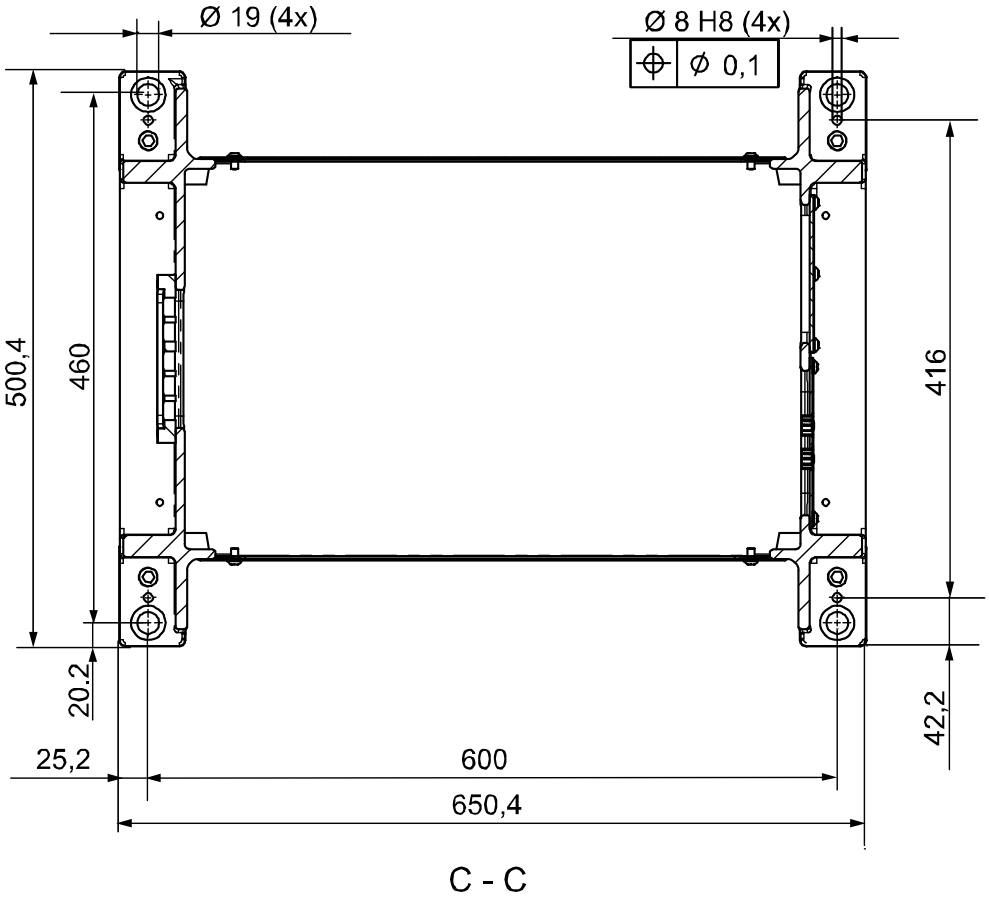

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2.2.4 Dimensional drawings

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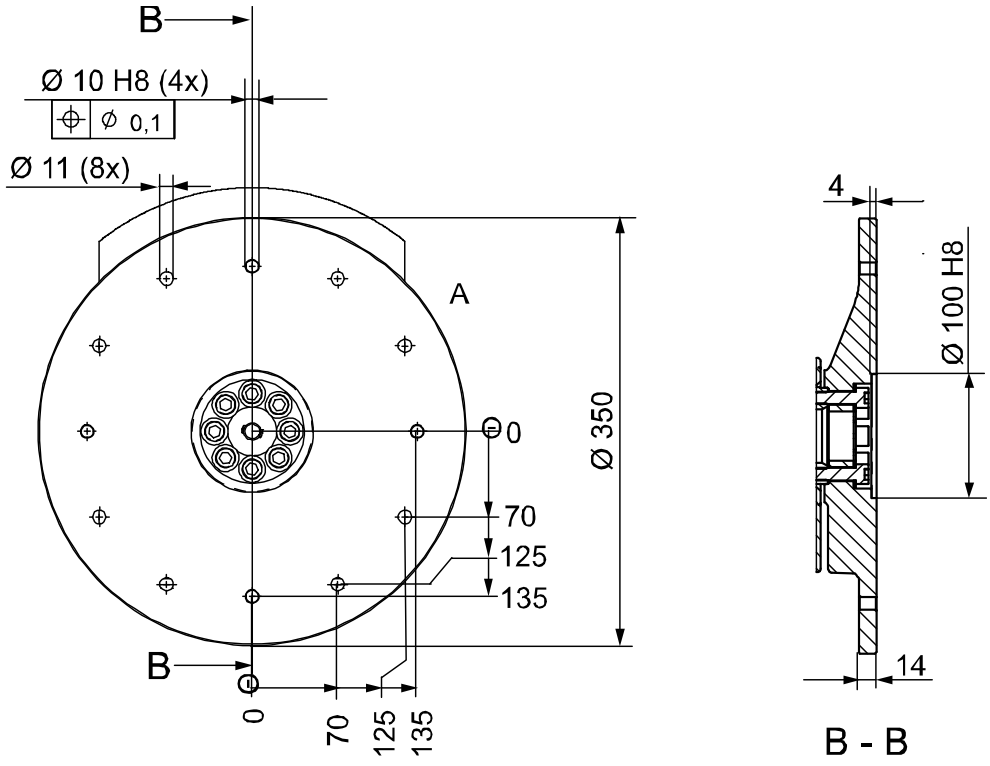

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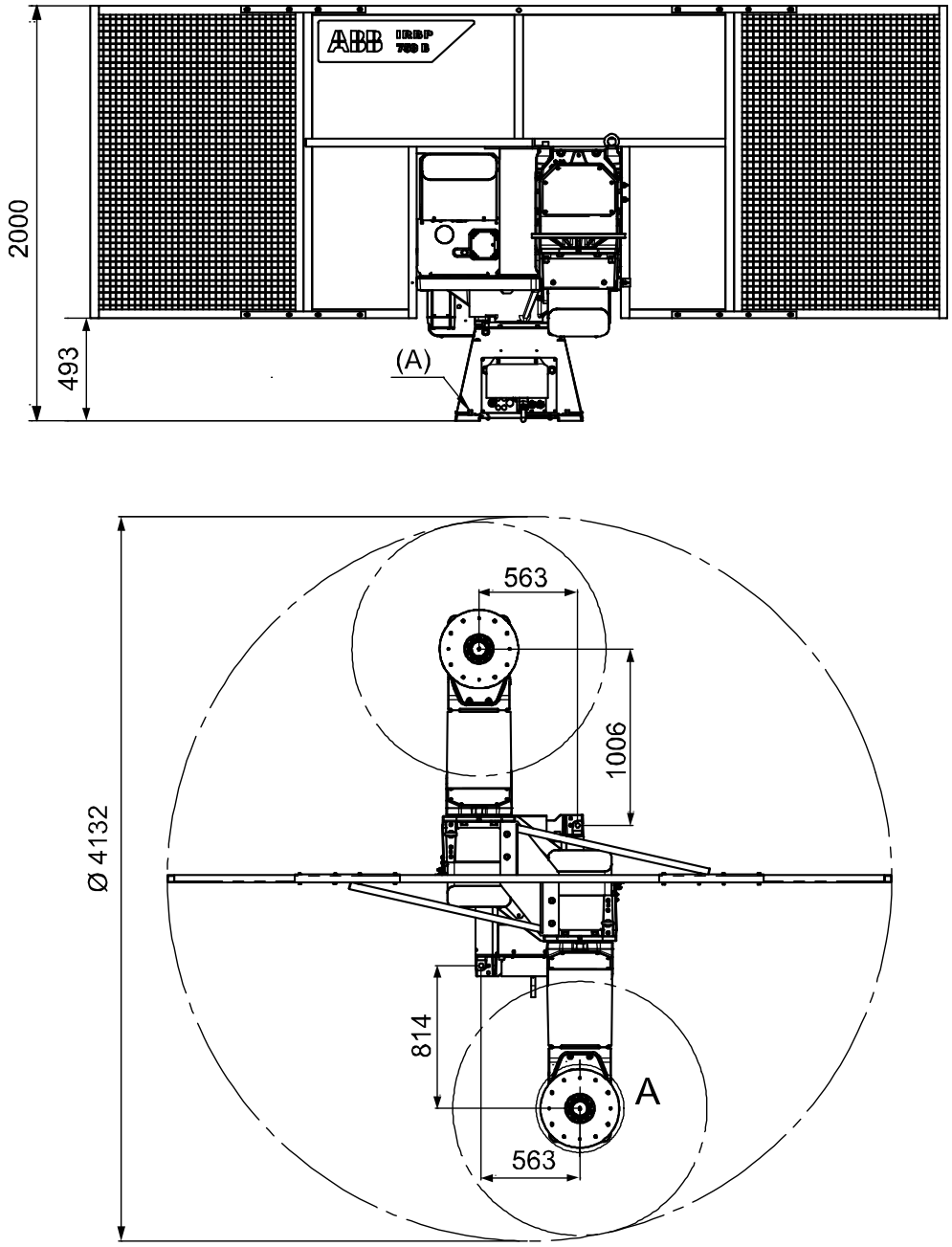
IRP B-500 / -750



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Pos	Description
A	Adjusting bolts

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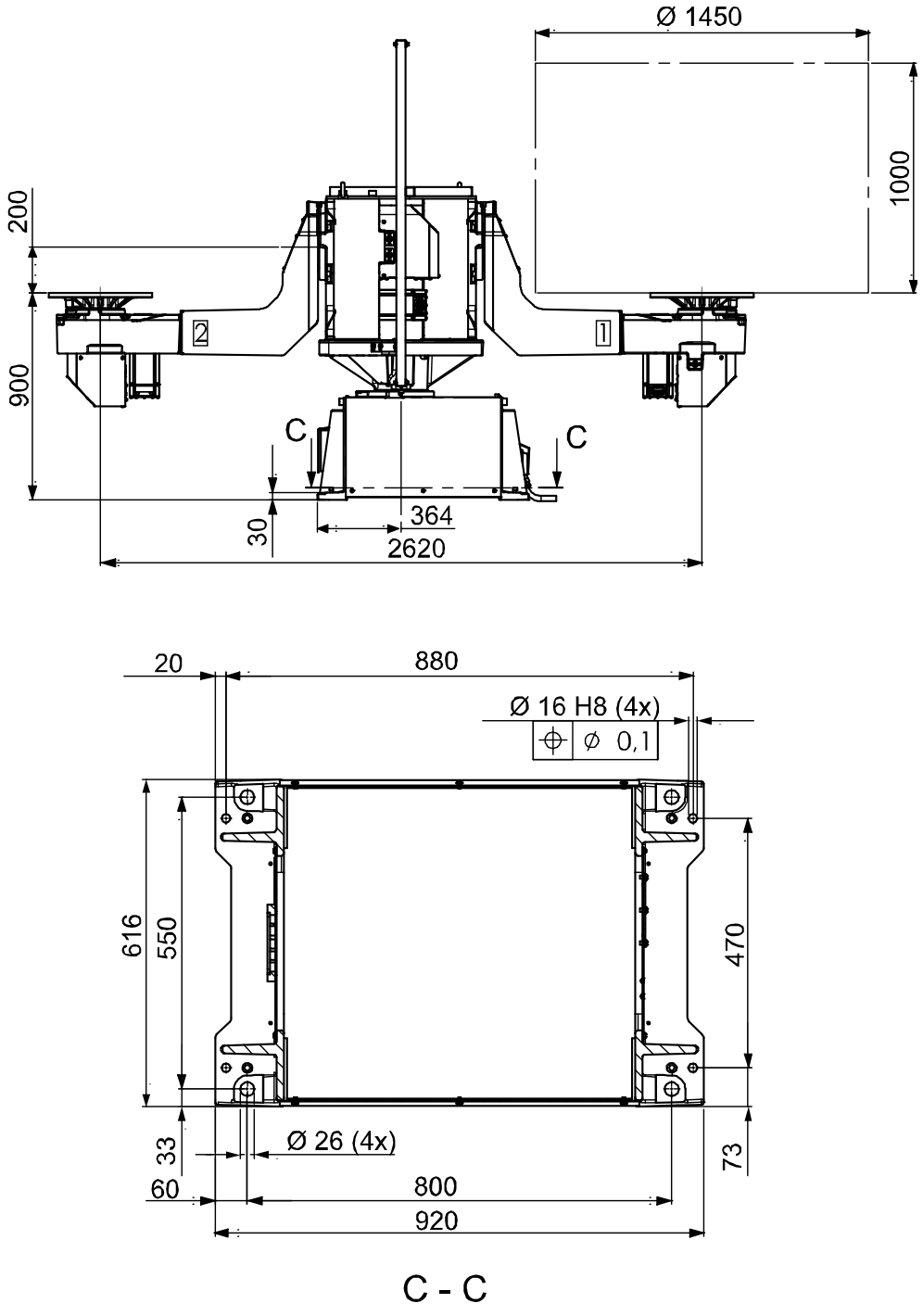
2.2.4 Dimensional drawings

Continued



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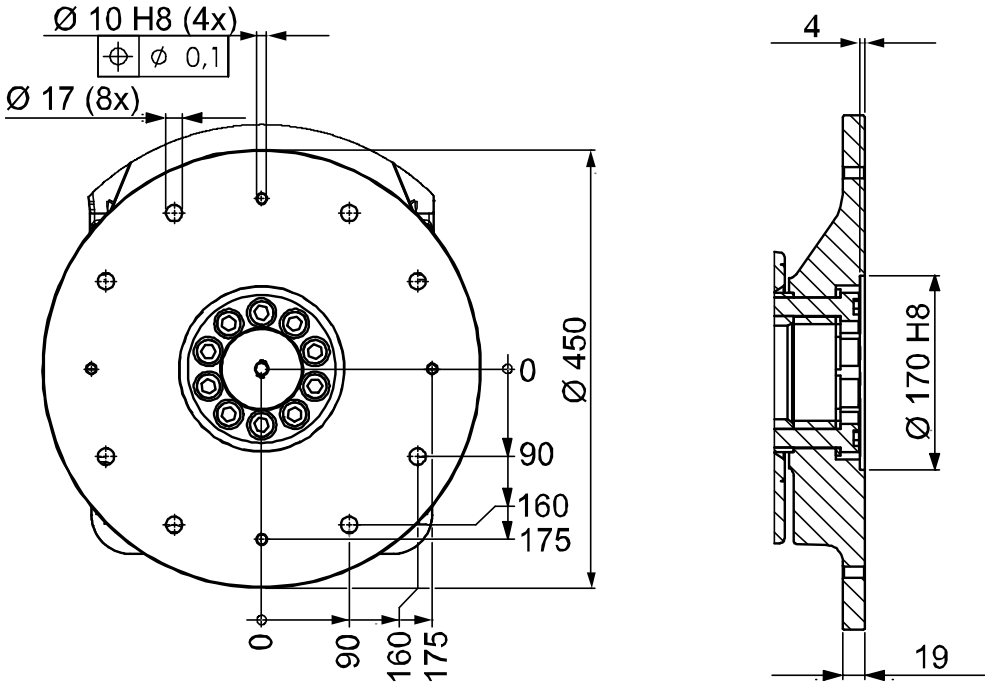

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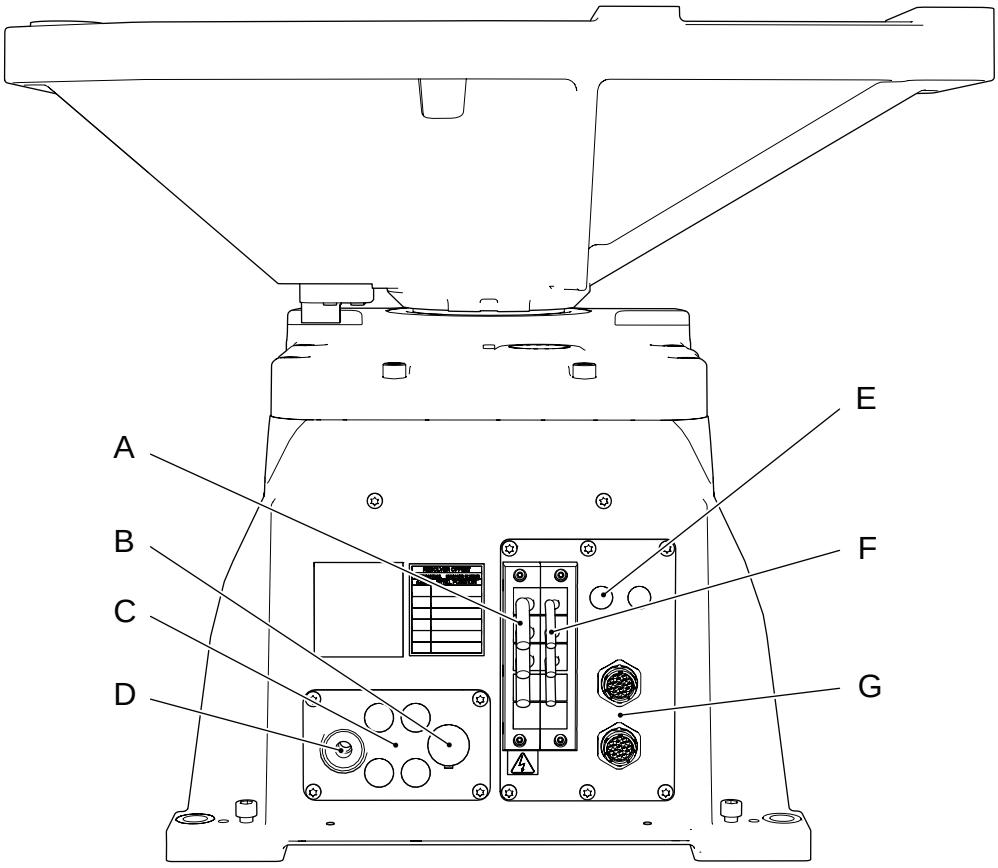
2.2.4 Dimensional drawings
Continued

Connections



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Pos	Description	Pos	Description
A	Power, axis 1 (IRP C) Power, axis 1-3 (IRP R)	E	Profibus (option)
B	Extra weld return cable (option)	F	Resolver signal, axis 1 (IRP C) Resolver signal, axis 1-3 (IRP R)
C	Air (option)	G	Customer power (option)
D	Weld return cable		

2.3 IRP C-500/1000

2.3.1 General

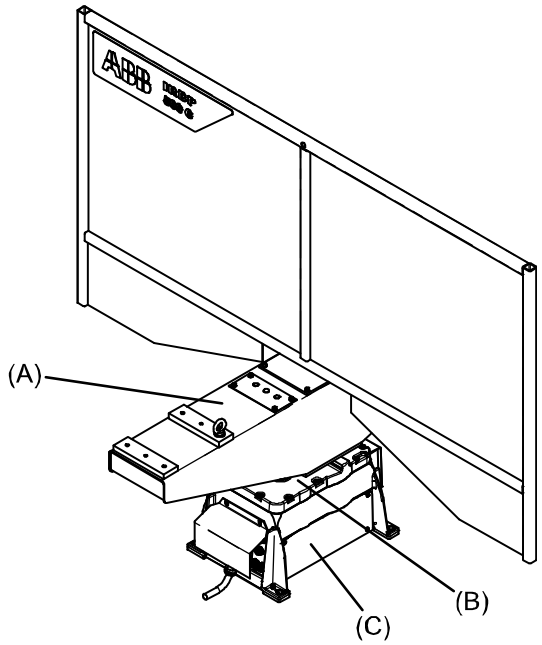
Introduction

The positioner is designed to handle workpieces of a weight up to 500/1000 kg (including the fixture) in connection with robot processes.

The positioner features a twin station solution where the robot works on one side and the operator loads and unloads on the other.

The modular design, few and heavy-duty moving parts as well as minimal maintenance demands make the positioner service friendly.

The positioner is designed with the following main sections (Figure below):



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Pos	Description
A	Stand
B	Station interchange unit, INTERCH
C	SMB unit

On the outgoing shaft of the station interchange unit there is a frame on which two fixed tables are fitted.

The tables have plain holes and guide holes for securing fixtures.

A screen is fitted between the two stations, which protects the operator from arc-eye.

The drive equipment is placed in the system's equipment cabinet.

2.3.2 Technical data

General

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP C-500	IRP C-1000
Max. handling capacity	500 kg / side	1000 kg / side
Max load difference between sides 1 and 2 at operation	350 kg	500 kg
Center of gravity	See loading table	See loading table
Repetition accuracy with equal loads and radius 500 mm	±0.05 mm	±0.05 mm
Index time	3.3 - 3,8 s	3.5 - 3.7 s
Weld to weld time	5.1 - 5.6 s	5.8 - 6.0 s
Max welding power, 60% duty cycle	600 Amp	600 Amp
Weight	380 kg	660 kg

2.3.3 Loading table

IRP C-500

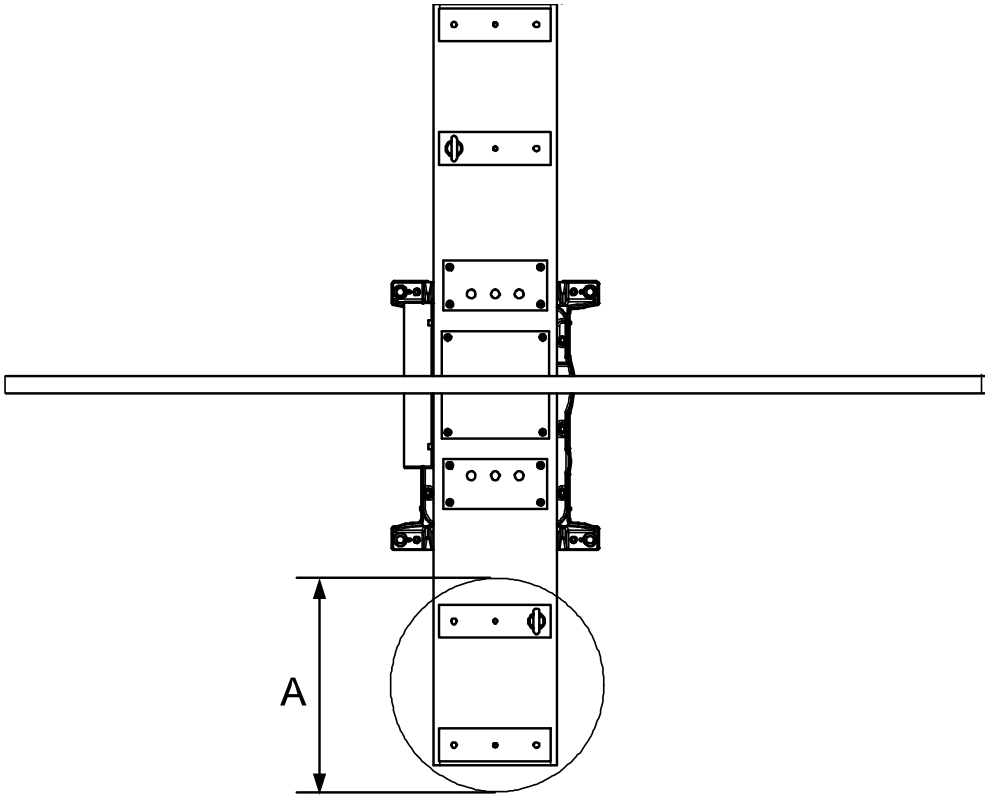
The table shows the limits for the position of the center of gravity at different loads.

If the load is 500 kg the center of gravity for the workpiece including the fixture must be within the area which is limited by the circle with a diameter of A.

If the load is, for example, 475 kg use the column immediately above, that is the 500 kg column.

The sides can be loaded with different weights as long as the load difference between the side 1 and side 2 is less than 350 kg.

Weight of the workpiece including fixture (kg)	500	450	400	350	300	250
Ø A (mm)	120	220	350	500	680	850



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2.3.3 Loading table
Continued

IRP C-1000

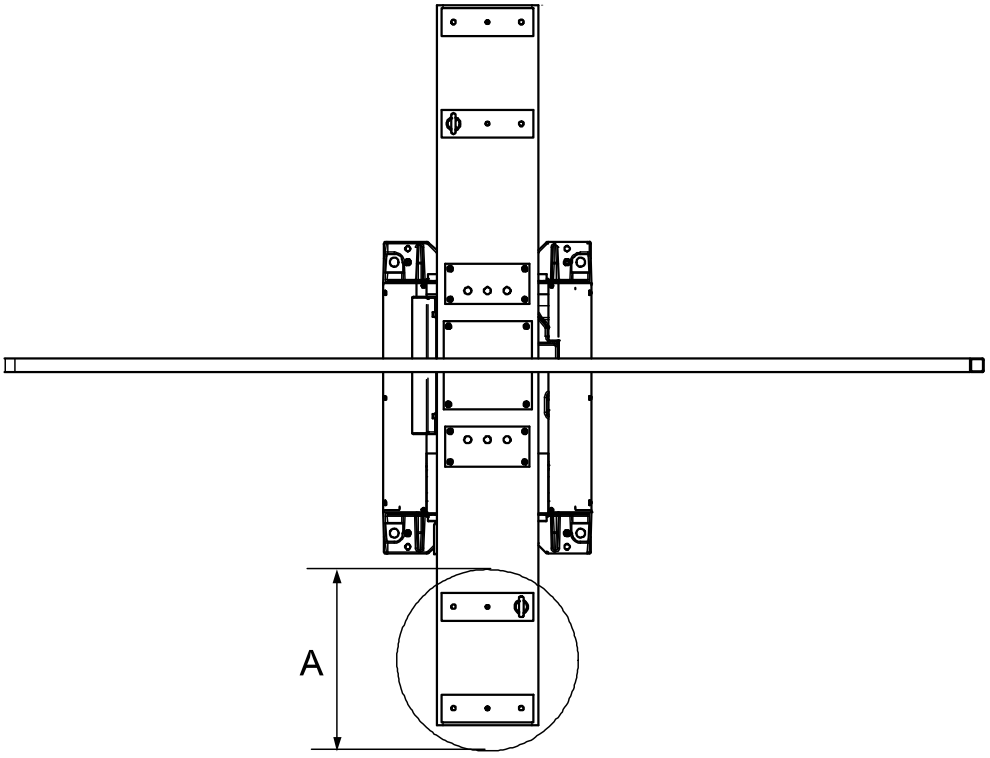
The table shows the limits for the position of the center of gravity at different loads.

If the load is 1000 kg the center of gravity for the workpiece including the fixture must be within the area which is limited by the circle with a diameter of A.

If the load is, for example, 820 kg use the column immediately above, that is the 850 kg column.

The sides can be loaded with different weights as long as the load difference between side 1 and side 2 is less than 500 kg.

Weight of the workpiece including fixture (kg)	1000	950	900	850	800	750	700	650
Ø A (mm)	400	470	550	620	700	790	900	1000



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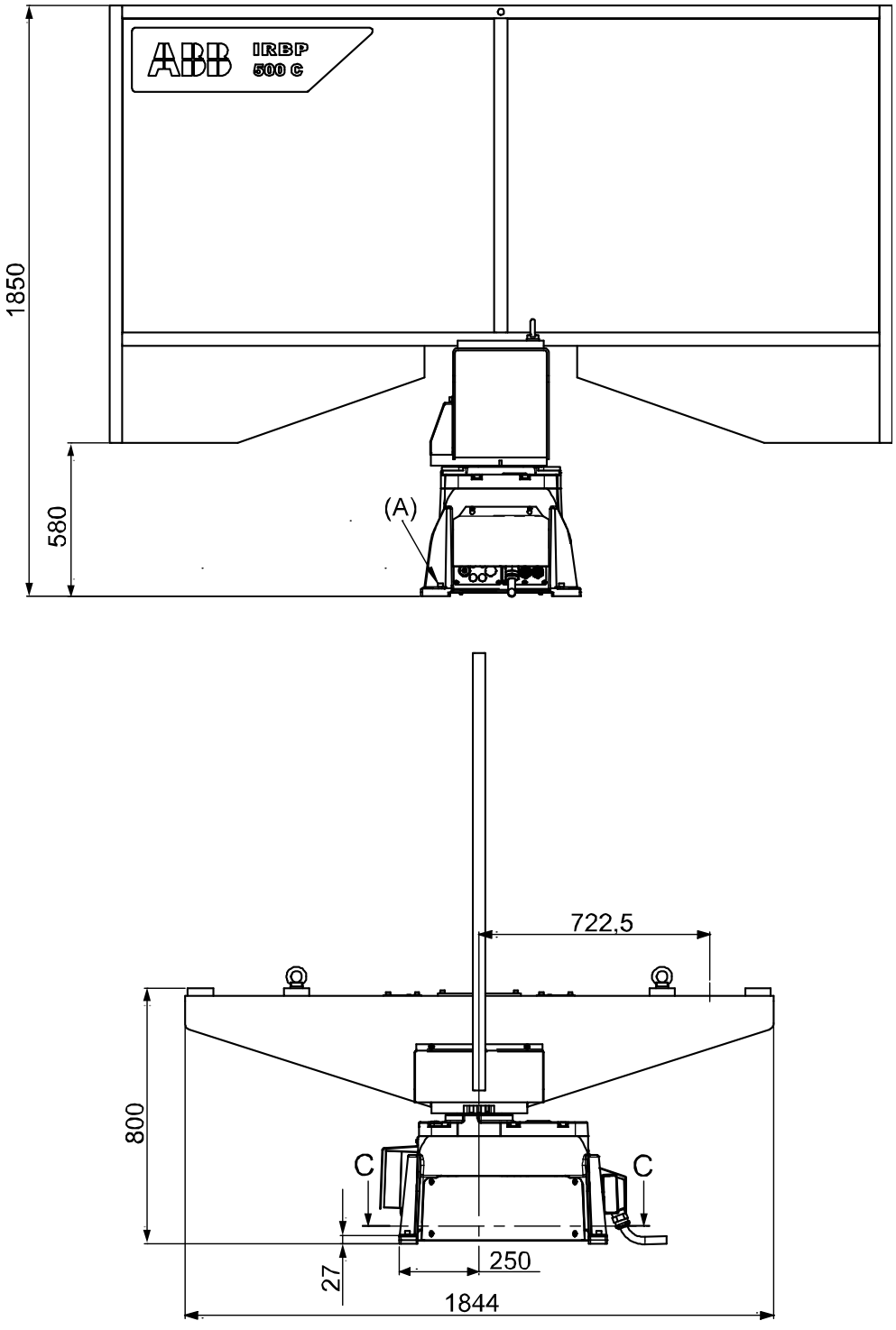
2.3.4 Dimensional drawings

IRP C-500



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Pos	Description
A	Adjusting bolts

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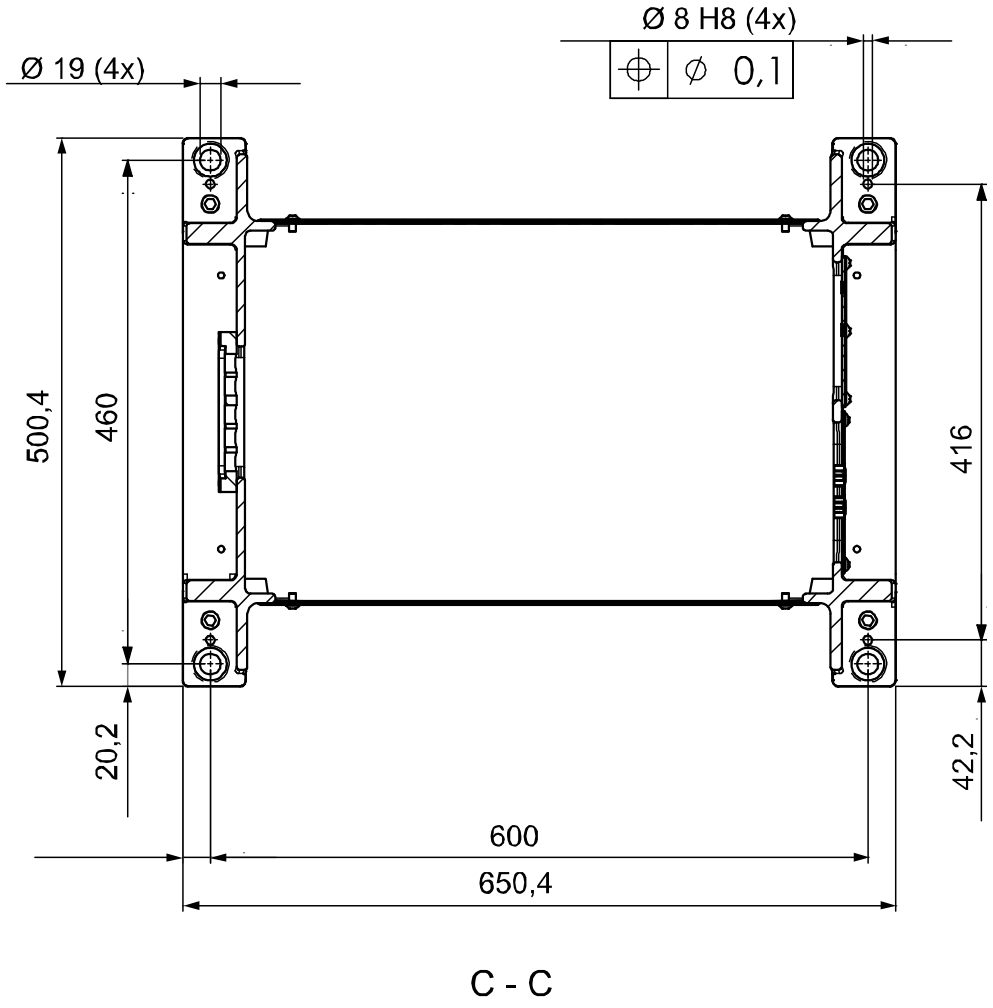
2.3.4 Dimensional drawings

Continued



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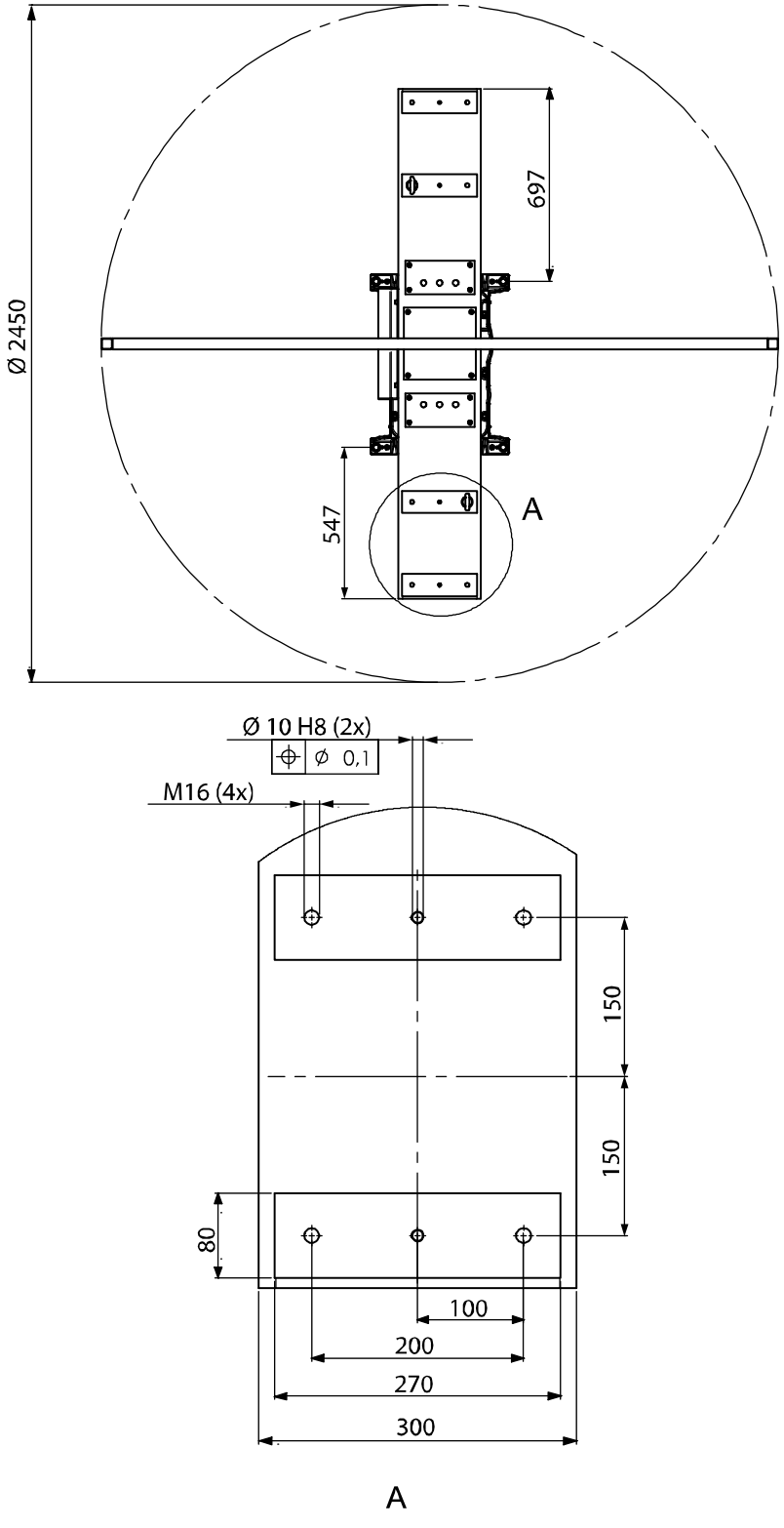

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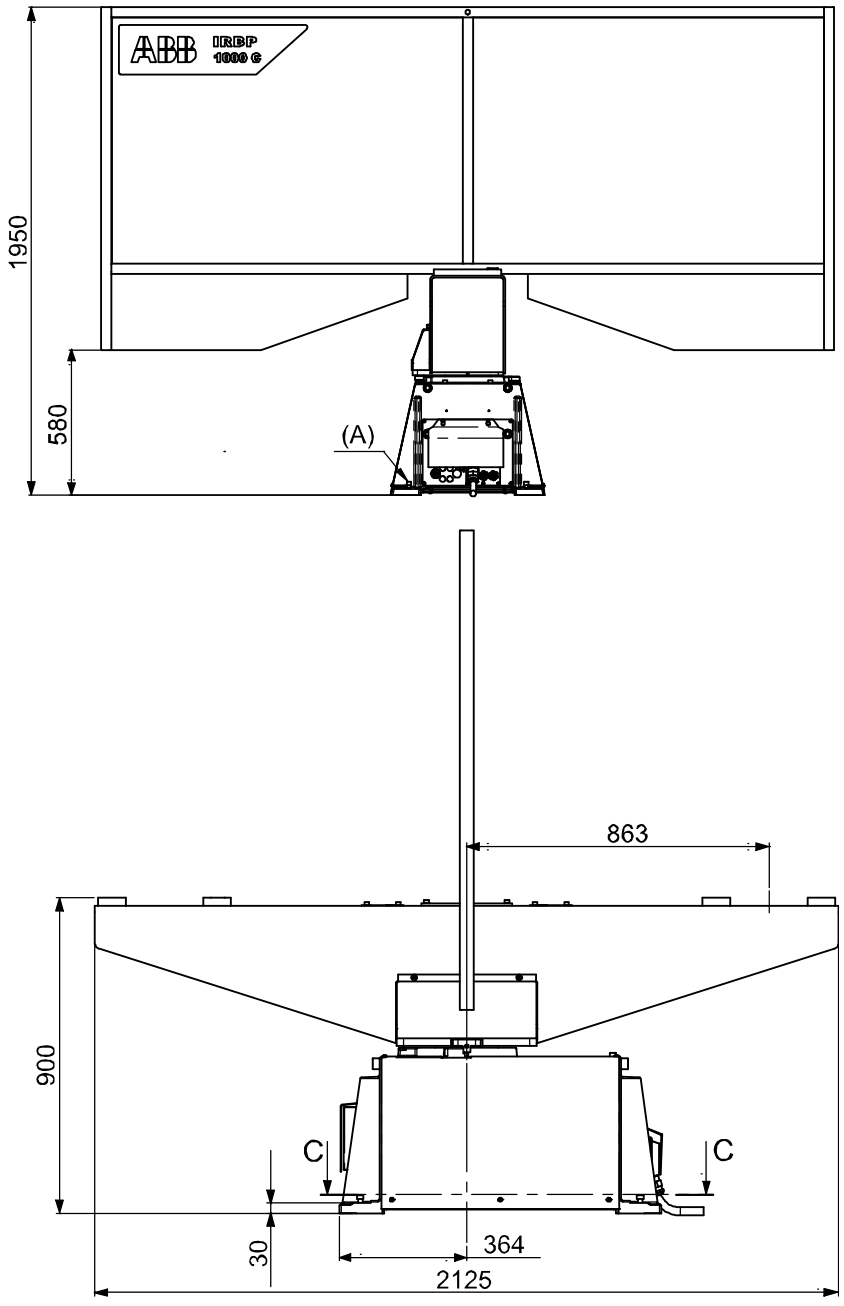
2.3.4 Dimensional drawings

Continued

IRP C-1000



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Pos	Description
A	Adjusting bolts

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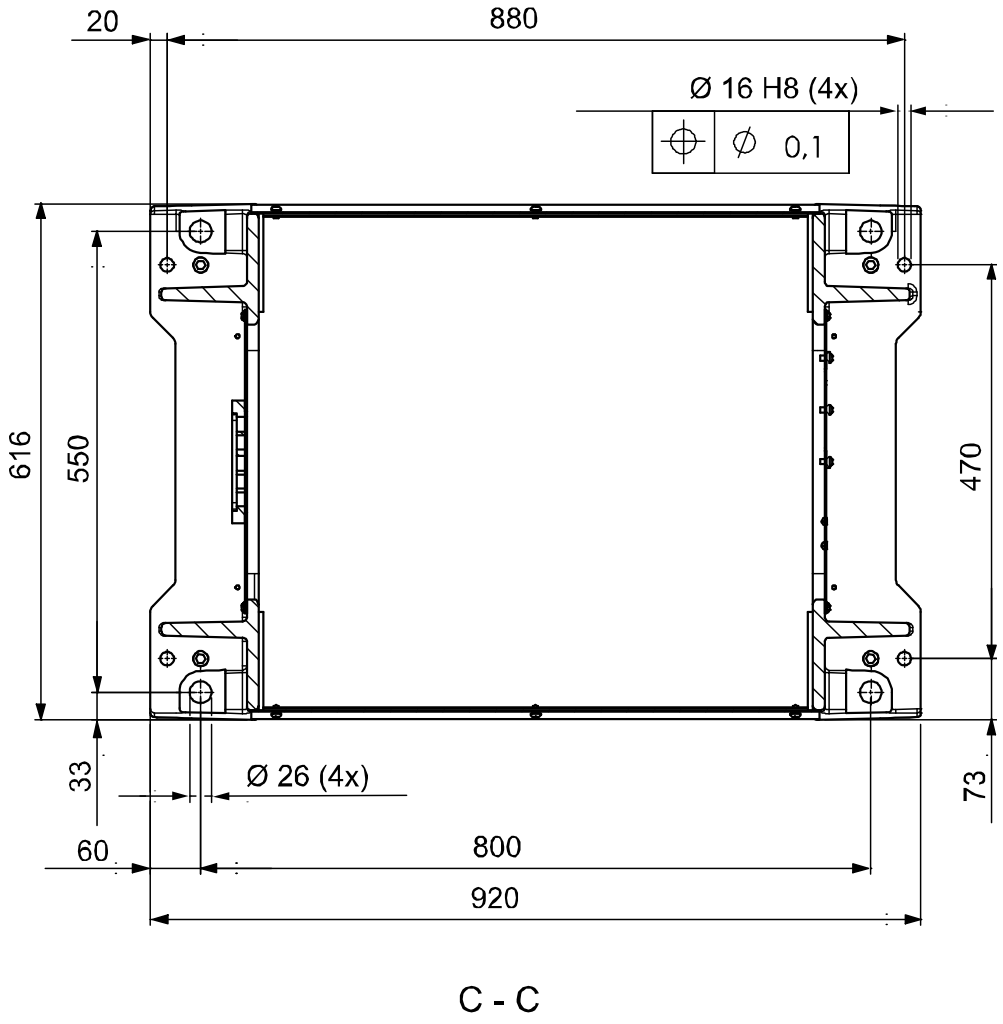

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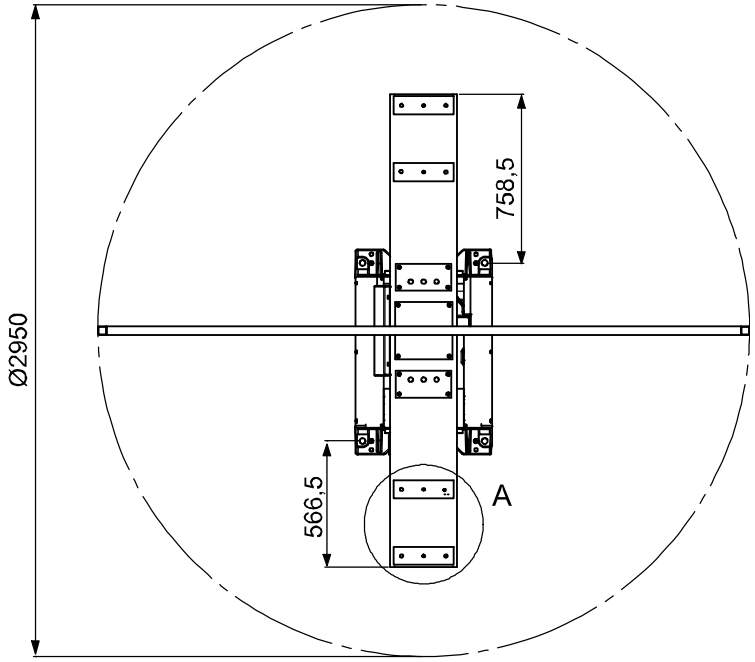
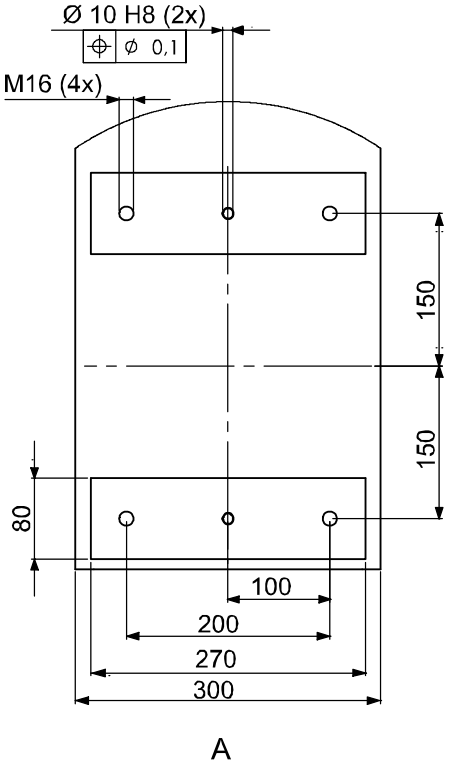
2.3.4 Dimensional drawings

Continued





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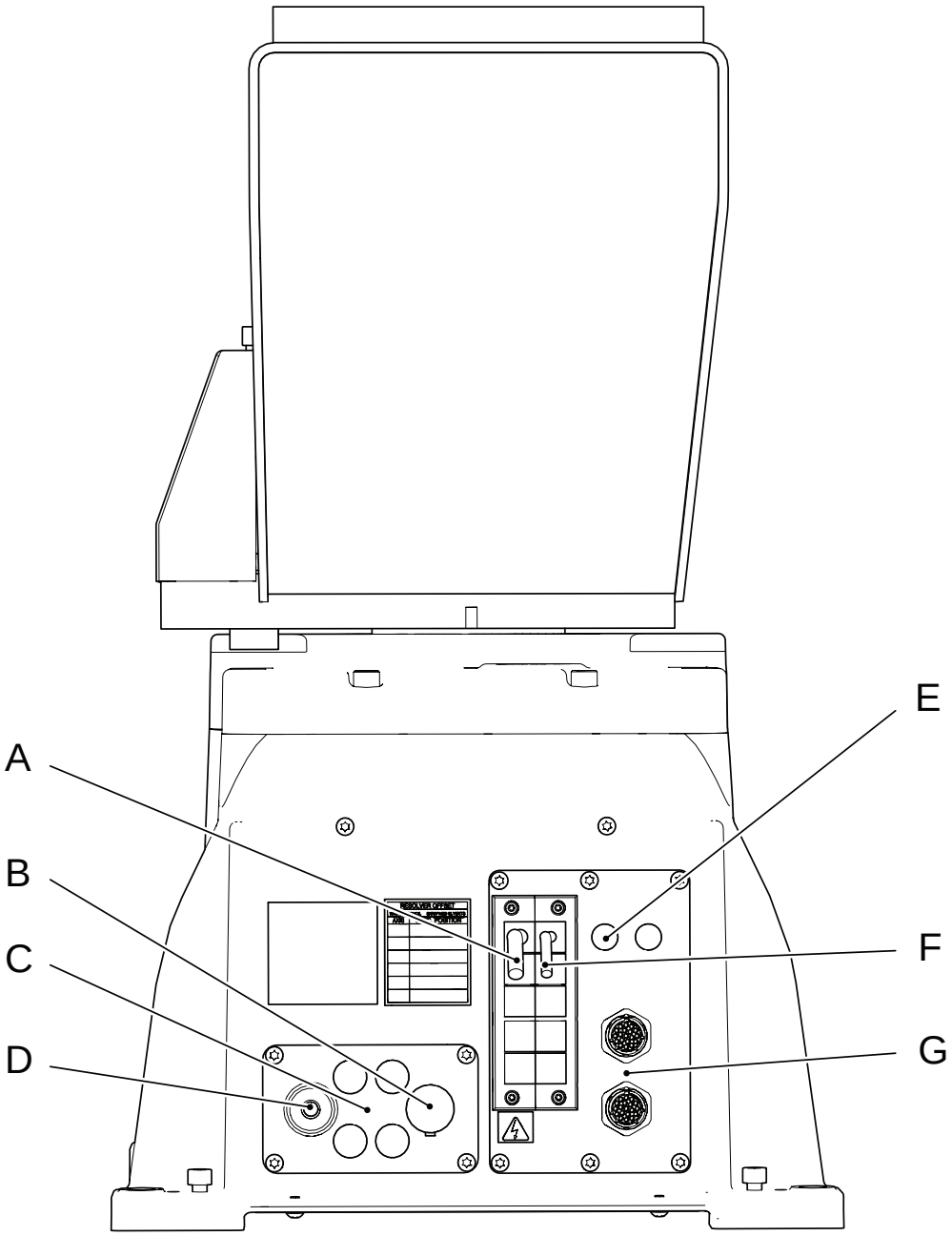
Connections



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Pos	Description	Pos	Description
A	Power, axis 1 (IRP C) Power, axis 1-3 (IRP R)	E	Profibus (option)
B	Extra weld return cable (option)	F	Resolver signal, axis 1 (IRP C) Resolver signal, axis 1-3 (IRP R)
C	Air (option)	G	Customer power (option)
D	Weld return cable		

2.4 IRP K-300/ -600/ -1000

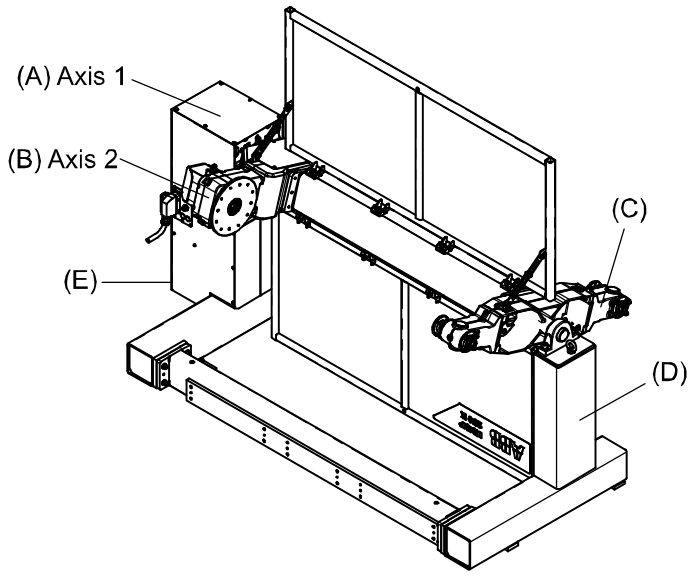
2.4.1 General

Introduction

The positioner is designed to handle workpieces of a weight up to 300/600/1000 kg including the fixture in connection with robot processes.

The positioner features a twin station solution where the robot works on one side and the operator loads and unloads on the other.

The modular design, few and heavy-duty moving parts as well as minimal maintenance demands make the positioner service friendly.The positioner is designed with the following main sections (see Figure below):



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Pos	Description	Pos	Description
A	Station interchange unit, INTERCH	D	Stand
B	Rotary unit, PLATE	E	SMB unit
C	Support bearing		

On the outgoing shaft of the station interchange unit (A, ARM) there is a frame on which two rotary units are fitted.

On the outgoing shaft of the rotary unit (B, PLATE) a faceplate is fitted. The faceplate has plain holes and guide holes for securing fixtures. On the opposite side there is a support collar used for fixture support.

A screen is fitted between the two stations, which protects the operator from arc-eye.

The rotary unit is fitted with a current collector in the form of a slip ring in order to transfer weld current.

The drive equipment for the positioner is placed in the system's equipment cabinet.

2.4.2 Technical data

IRP K-300

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP K-300(Ø 1000)	IRP K-300(Ø 1200)
Max. handling capacity	300 kg, see load diagram	300 kg, see load diagram
Max load difference between sides 1 and 2 at operation	180 kg	180 kg
Max. continuous torque	350 Nm	350 Nm
Center of gravity	See loading diagram	See loading diagram
Max bending moment	650 Nm	650 Nm
Positioning time 90 degrees	0.8 -1.2 s	0.8 -1.2 s
Positioning time 180 degrees	1.4 -1.9 s	1.4 -1.9 s
Positioning time 360 degrees	2.3 -2.7 s	2.3 -2.7 s
Repetition accuracy with equal loads and radius 500 mm	±0.05 mm	±0.05 mm
Max. speed of rotation	180 deg/s	180 deg/s
Index time	3,1 - 3,4 s	3,2 - 3,5 s
Weld to weld time	5.2 - 5.5 s	5.3 - 5.6 s
Max welding current, 60% duty cycle	600 Amp	600 Amp
Weight	1090 -1435 kg	1170 -1515 kg

IRP K-600

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP K-600 (Ø 1200)	IRP K-600 (Ø 1400)
Max. handling capacity	600 kg	600 kg
Max load difference between sides 1 and 2 at operation	400 kg	400 kg
Max. continuous torque	650 Nm	650 Nm
Center of gravity	See loading diagram	See loading diagram
Max bending moment	3300 Nm	3300 Nm
Positioning time 90 degrees	1.0 -1.3 s	1.0 -1.3 s
Positioning time 180 degrees	1.5 -2.1 s	1.5 -2.1 s
Positioning time 360 degrees	2.7 -3.4 s	2.7 -3.4 s

Continues on next page

2.4.2 Technical data
Continued

Technical Data	IRP K-600 (Ø 1200)	IRP K-600 (Ø 1400)
Repetition accuracy with equal loads and radius 500 mm	±0.05 mm	±0.05 mm
Max. speed of rotation	150 deg/s	150 deg/s
Index time	3.1 - 3.4 s	3.1 - 3.4 s
Weld to weld time	5.2 - 5.6 s	5.2 - 5.6 s
Max welding current, 60% duty cycle	600 Amp	600 Amp
Weight	1980 -2475 kg	2080 -2570 kg

IRP K-1000

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP K-1000 (Ø 1200)	IRP K-1000 (Ø 1400)
Max. handling capacity	1000 kg	1000 kg
Max load difference between sides 1 and 2 at operation	350 kg	350 kg
Max. continuous torque	900 Nm	900 Nm
Center of gravity	See load diagram	See load diagram
Max bending moment	5000 Nm	5000 Nm
Positioning time 90 degrees	1.0 -1.3 s	1.0 -1.3 s
Positioning time 180 degrees	1.5 -2.1 s	1.5 -2.1 s
Positioning time 360 degrees	2.7 -3.5 s	2.7 -3.5 s
Repetition accuracy with equal loads and radius 500 mm	±0.05 mm	±0.05 mm
Max. speed of rotation	150 deg/s	150 deg/s
Index time	3,3 - 3,7 s	3,3 - 3,7 s
Weld to weld time	5.5 - 5.9 s	5.5 - 5.9 s
Max welding current, 60% duty cycle	600 Amp	600 Amp
Weight	1980 -2475 kg	2080 -2570 kg

2.4.3 Loading diagram

General

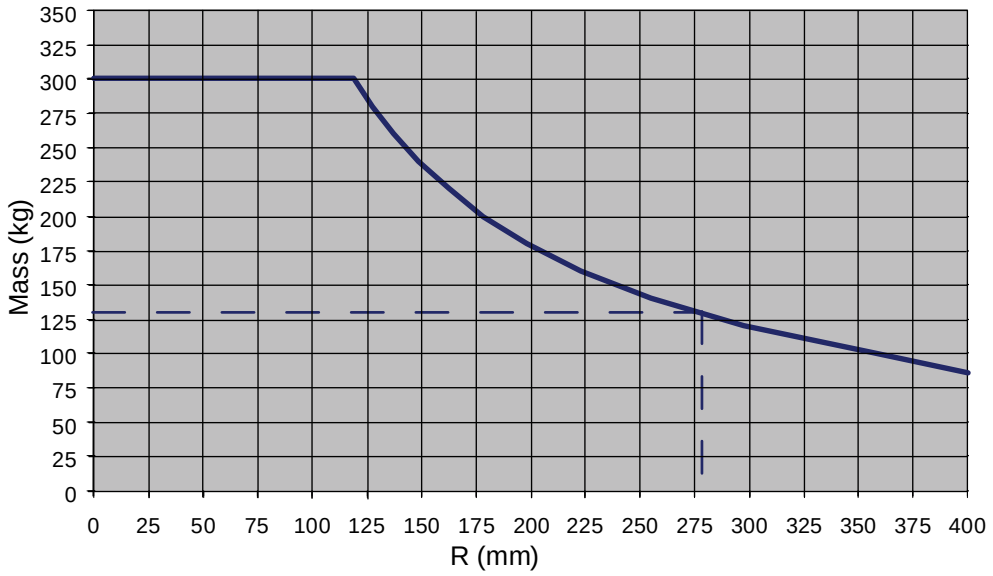
The diagrams (Figures below) show the maximum permitted center of gravity displacement from the center of rotation at different loads.

For the maximum load difference between side 1 and side 2, see the technical data in the chapter Positioner.

The load refers to the workpiece including the fixture. Also refer to the value for the max. continuous torque.

IRP K-300

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 129 kg.



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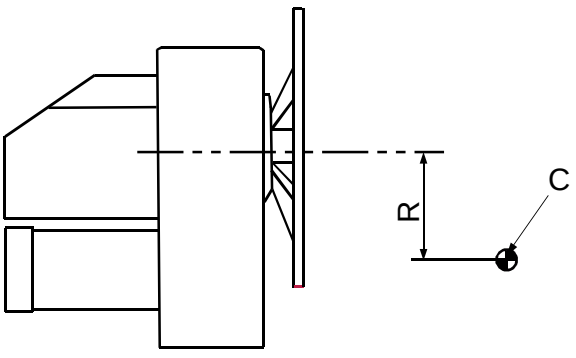

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Pos	Description
R	R = Distance in mm
C	Center of gravity

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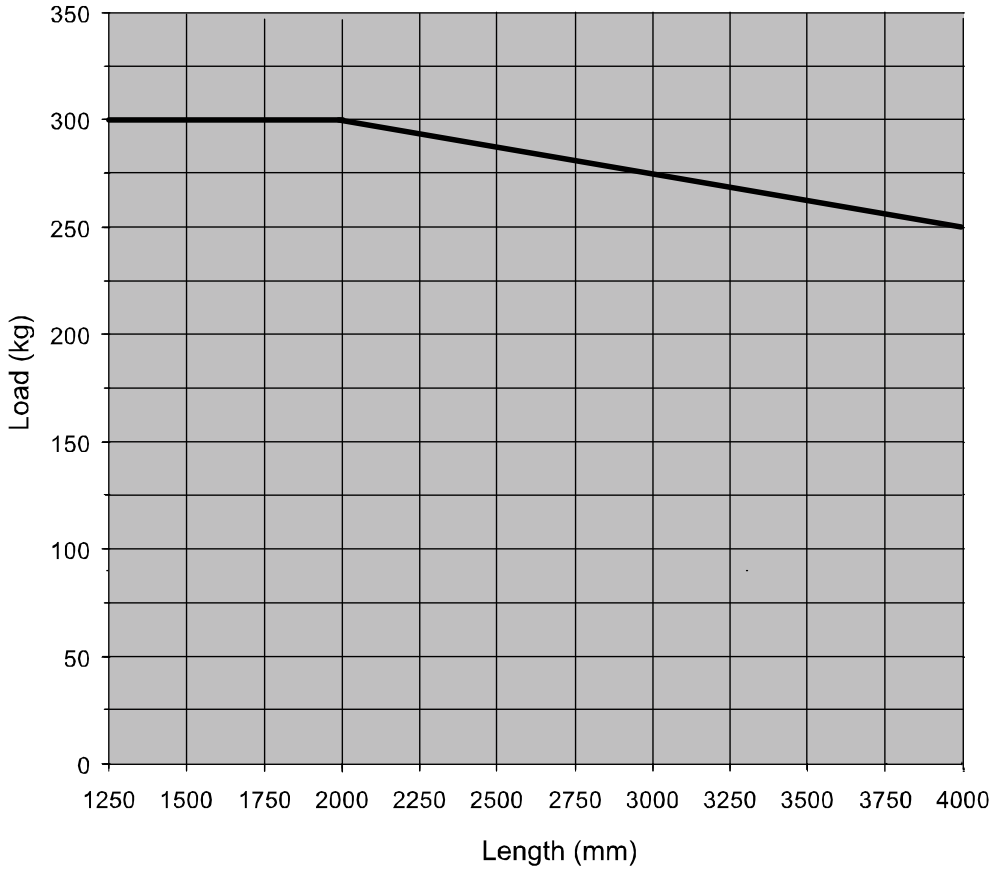
2.4.3 Loading diagram
Continued

Max load at different length between rotary unit and support collar is shown below.



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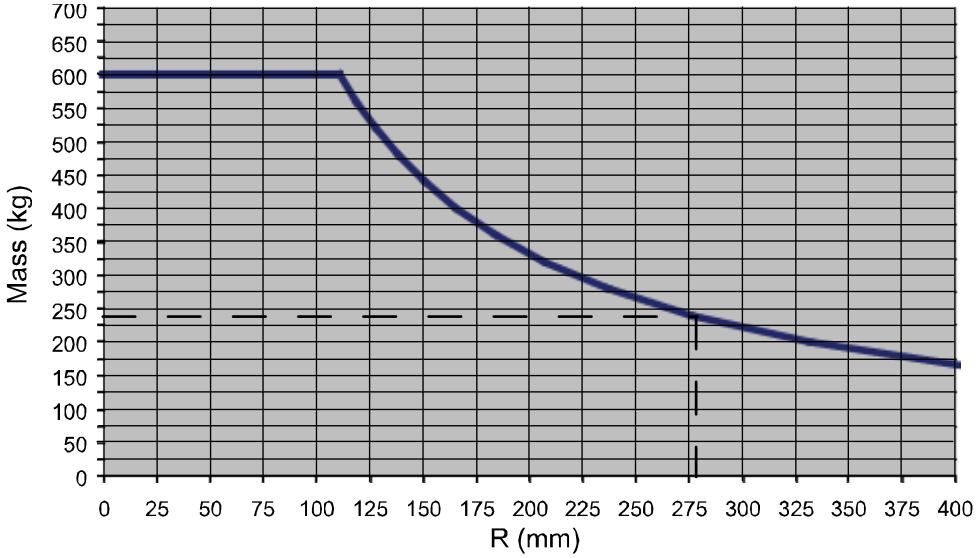
IRP K-600

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 240 kg. The load refers to the workpiece including the fixture.

Also refer to the value for the max. continuous torque.



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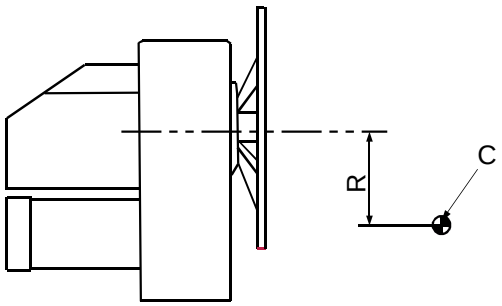

xx1000000801

Pos	Description
R	R = Distance in mm
C	Center of gravity

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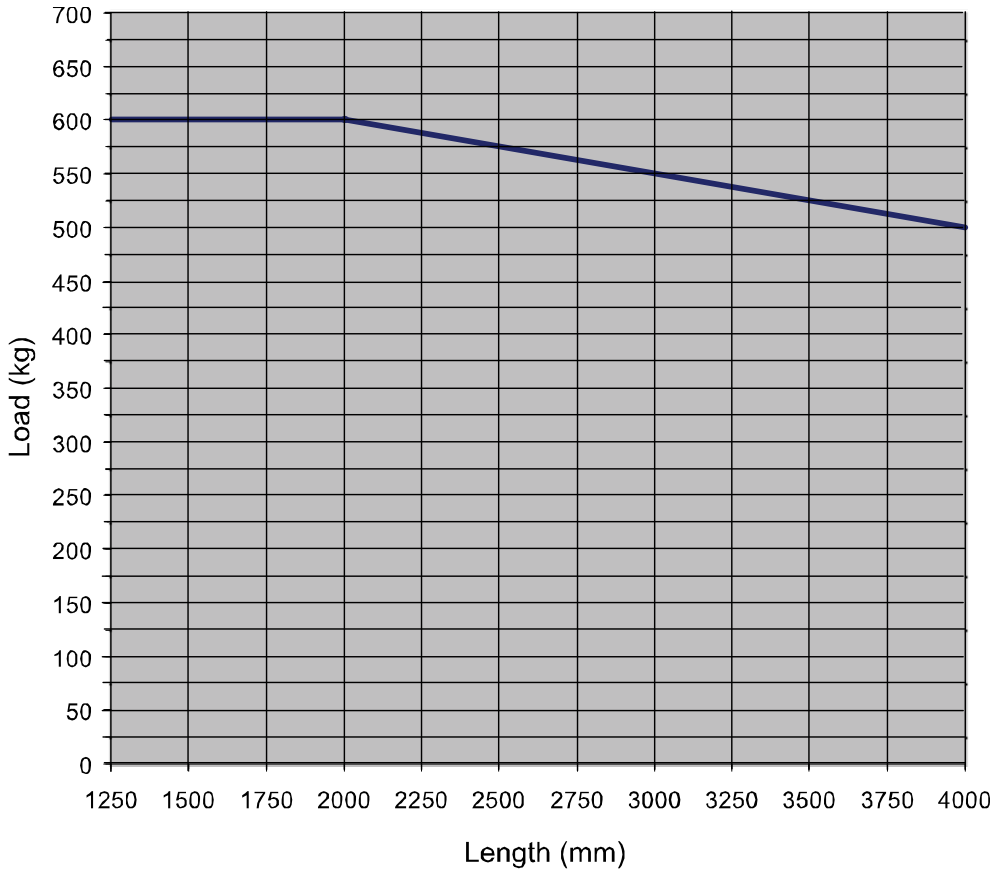
2.4.3 Loading diagram
Continued

Max load at different length between rotary unit and support collar is shown below.



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IRP K-1000

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 333kg. The load refers to the workpiece including the fixture.

Also refer to the value for the max. continuous torque.

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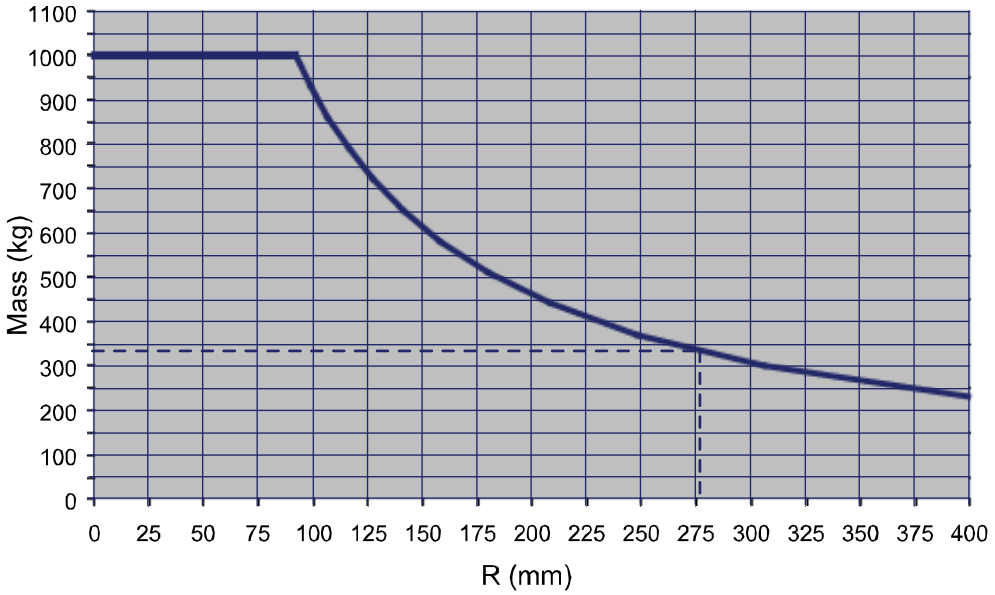

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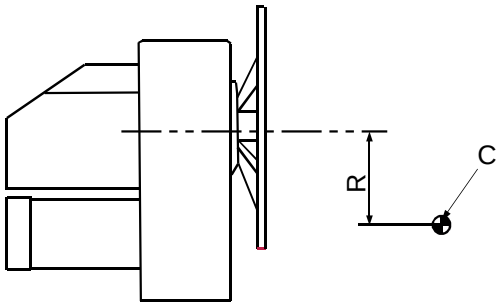

xx1000000801

Pos	Description
R	R = Distance in mm
C	Center of gravity

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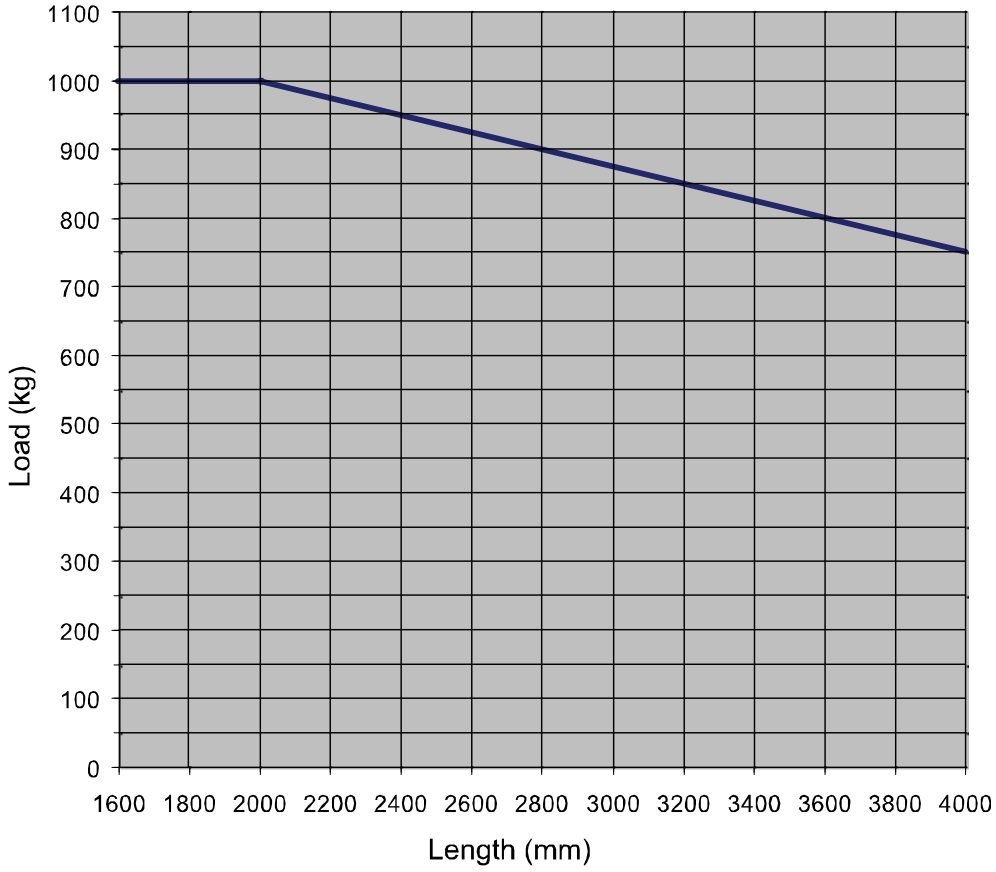
2.4.3 Loading diagram
Continued

Max load at different length between rotary unit and support collar is shown below.



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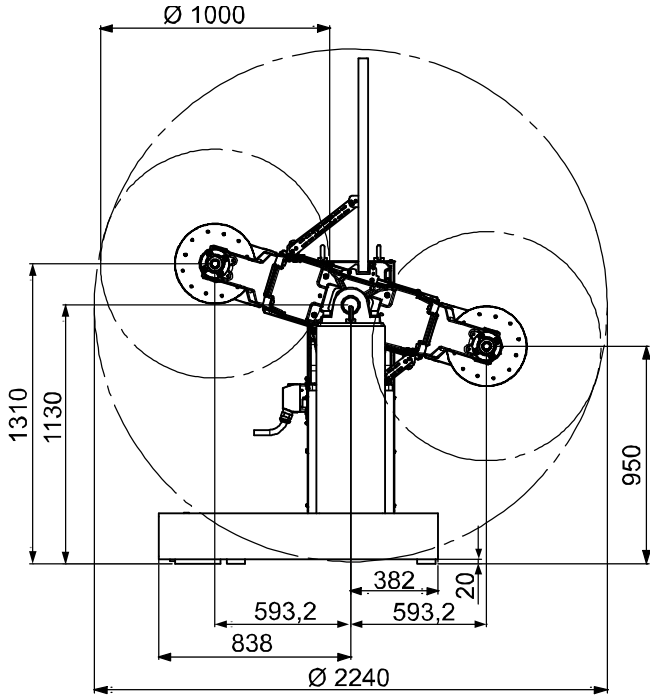
2.4.4 Dimensional drawings

IRP K-300 Ø 1000 mm



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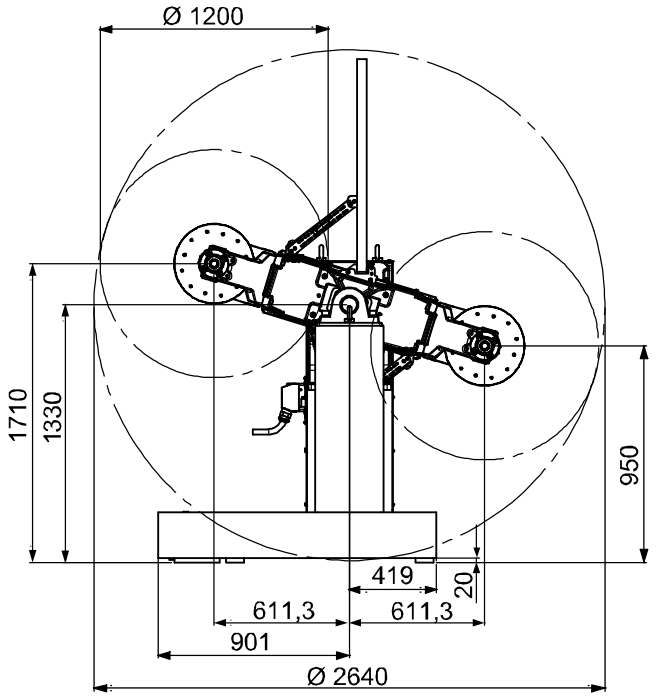
IRP K-300 Ø 1200 mm



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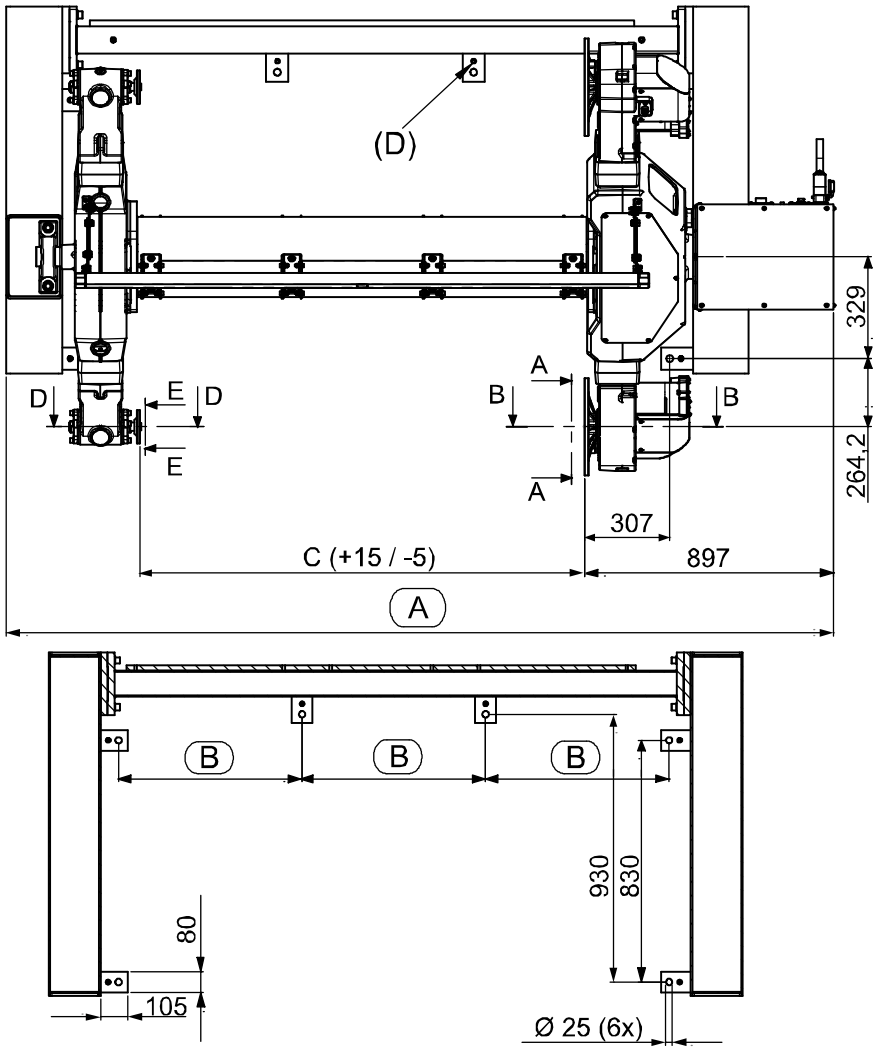
2.4.4 Dimensional drawings
Continued

IRP K-300 Ø1000 mm



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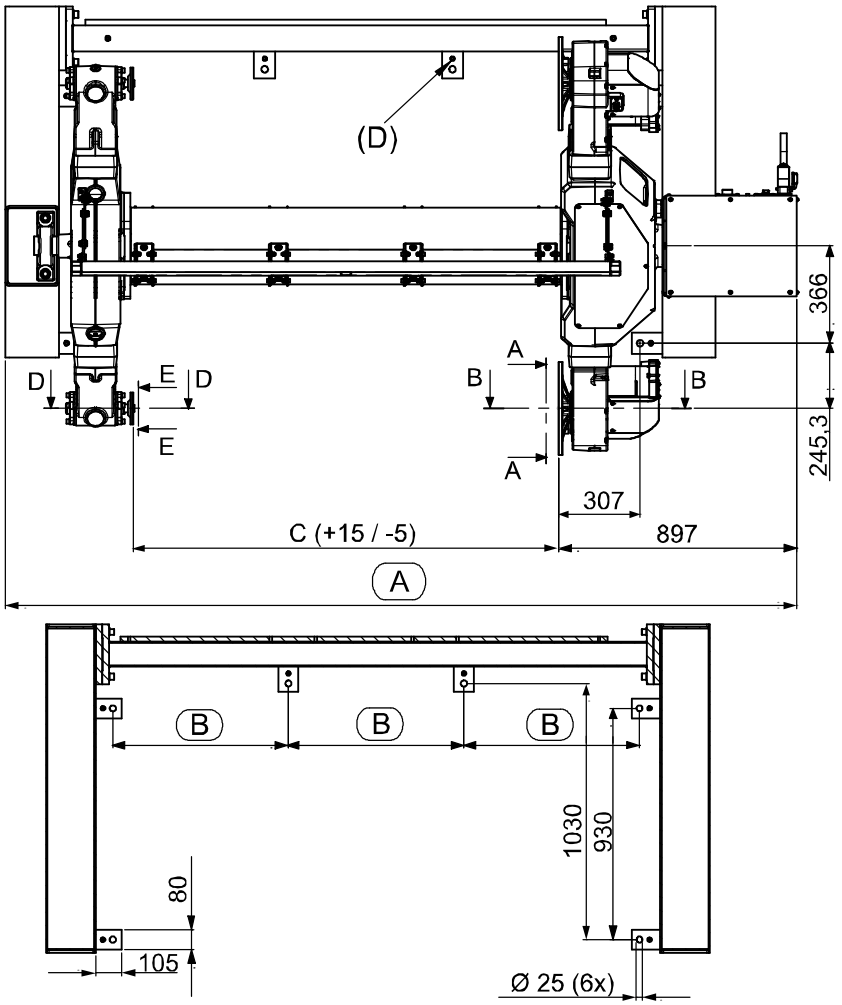
Pos	Description
C	Length
D	Adjusting bolts (6x)

IRP K-300 Ø1000		
C (mm)	**A (mm)**	**B (mm)**
1600	2977	706
2000	3377	840
2500	3877	1006
3150	4527	1223
3500	4877	1340
4000	5377	1506

Continues on next page

IRP K-300 Ø1200 mm



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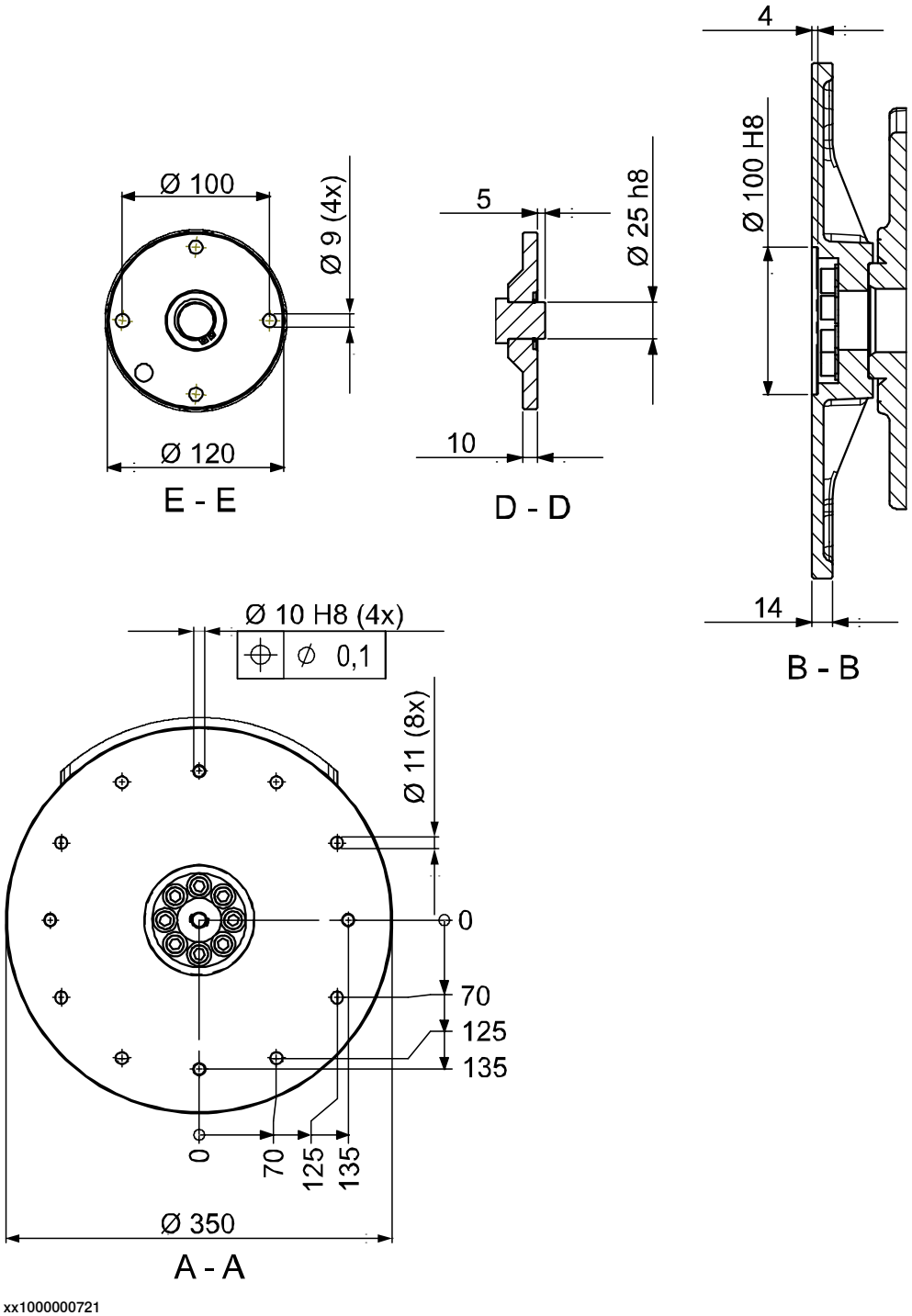
Pos	Description
C	Length
D	Adjusting bolts (6x)

IRP K-300 Ø1200		
C (mm)	**A (mm)**	**B (mm)**
1600	2977	706
2000	3377	840
2500	3877	1006
3150	4527	1223
3500	4877	1340
4000	5377	1506

Continues on next page

2.4.4 Dimensional drawings

Continued



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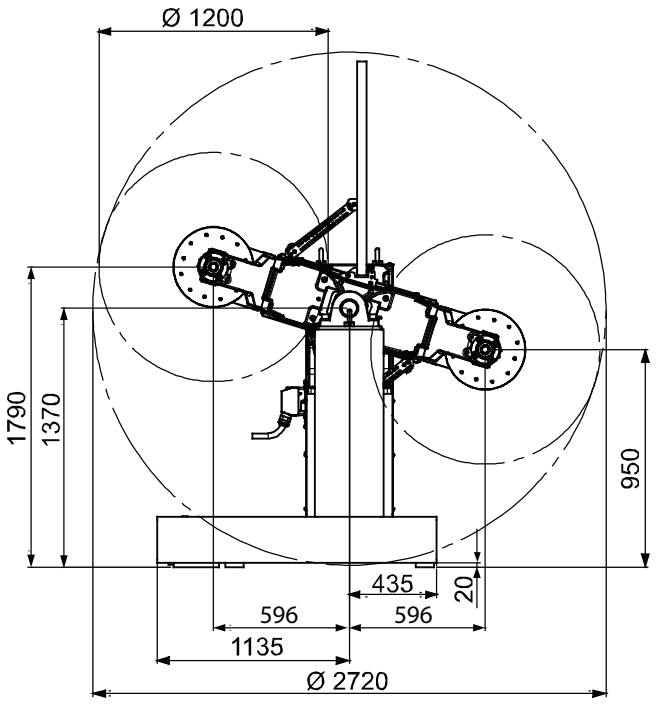
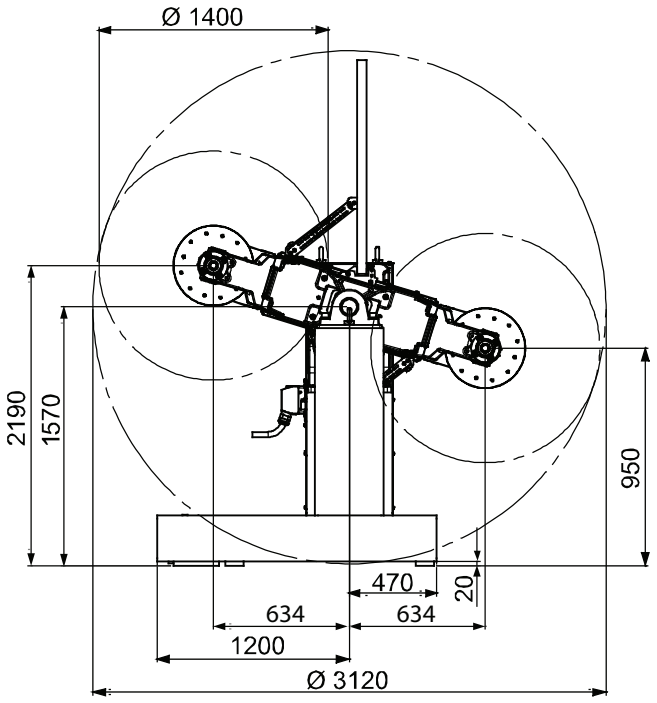
IRP K-600 / -1000 Ø1200 mm



xx1000000722

IRP K-600 / -1000 Ø1400 mm



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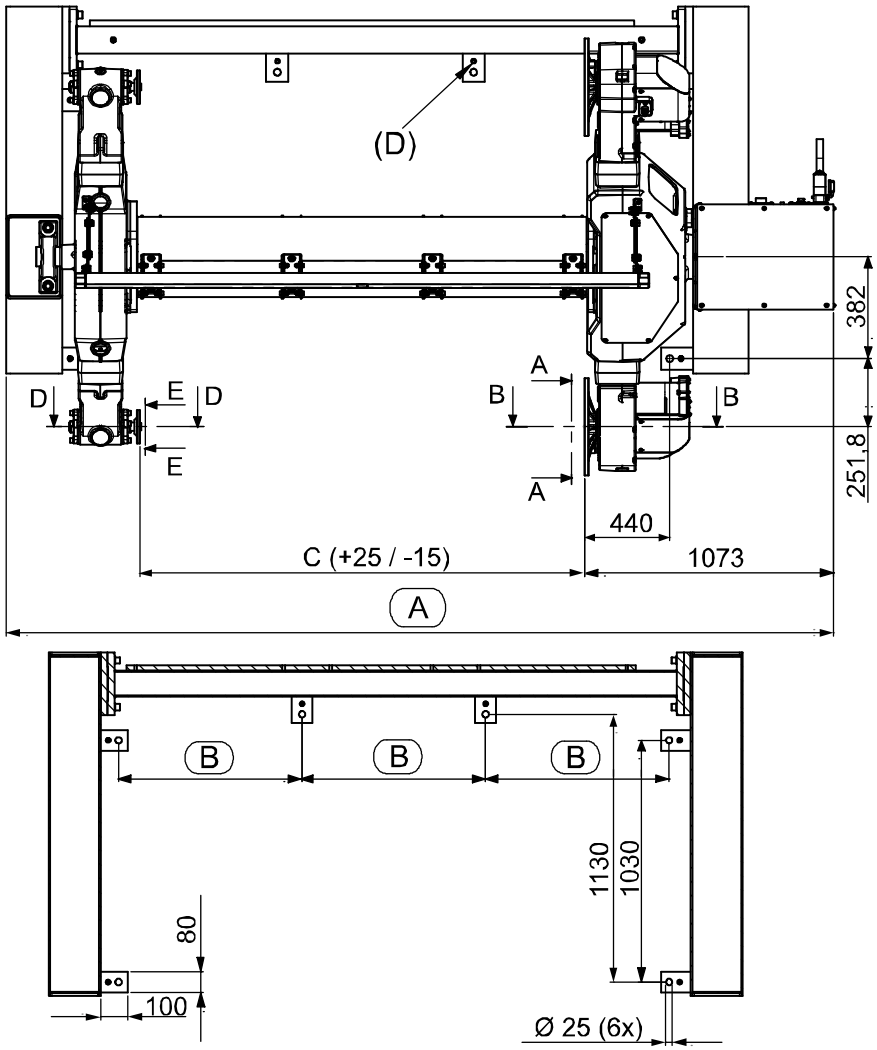
2.4.4 Dimensional drawings
Continued

IRP K-600 / -1000 Ø1200 mm



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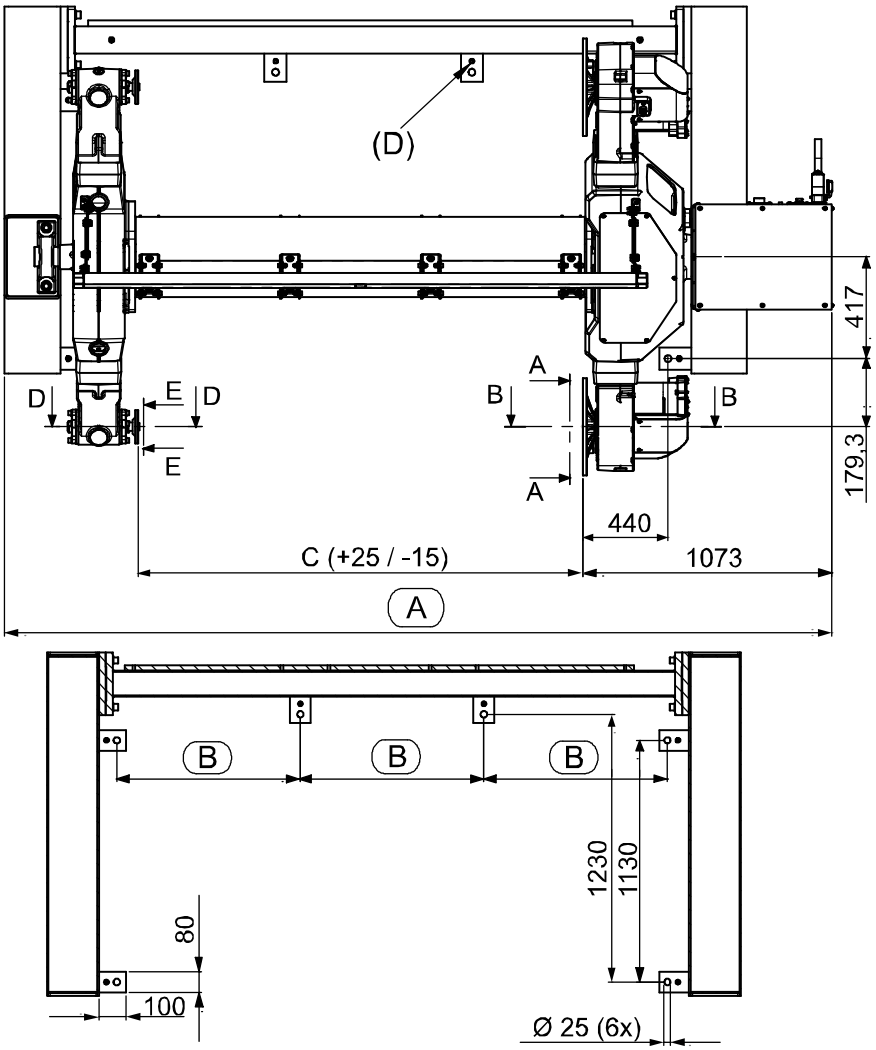
Pos	Description
C	Length
D	Adjusting bolts (6x)

IRP K-600 / -1000 Ø1200		
C (mm)	**A (mm)**	**B (mm)**
1600	3409	816
2000	3809	950
2500	4309	1116
3150	4959	1333
3500	5309	1450
4000	5809	1616

Continues on next page

IRP K-600 / -1000 Ø1400 mm



xx1000000725

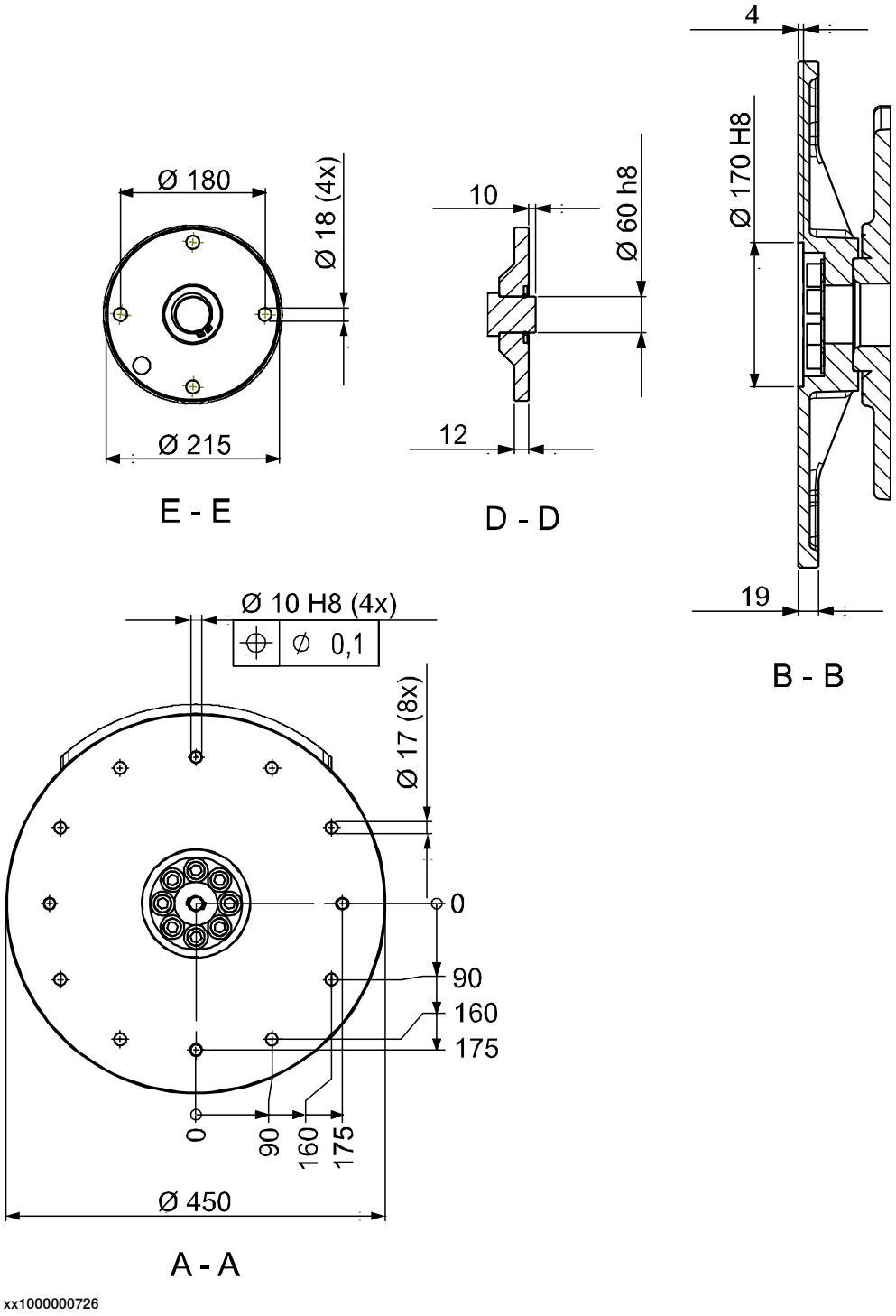
Pos	Description
C	Length
D	Adjusting bolts

IRP K-600 / -1000 Ø1200		
C (mm)	**A (mm)**	**B (mm)**
1600	3409	816
2000	3809	950
2500	4309	1116
3150	4959	1333
3500	5309	1450
4000	5809	1616

Continues on next page

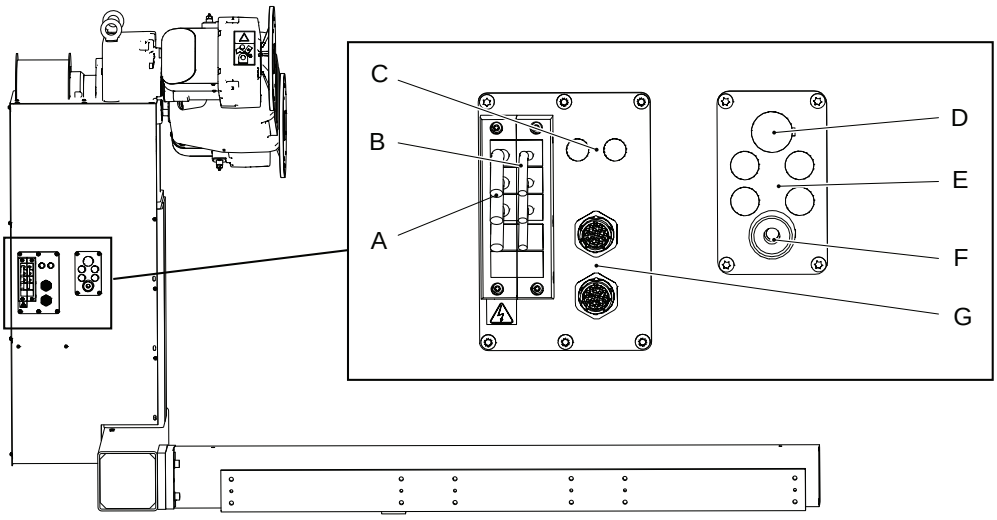
2.4.4 Dimensional drawings

Continued



Continues on next page

Connections



Pos	Description	Pos	Description
A	Power axis, 1-3	E	Air (option)
B	Resolver signal, axis 1-3	F	Weld return cable
C	Profibus (otion)	G	Customer power (option)
D	Extra weld return cable (option)		

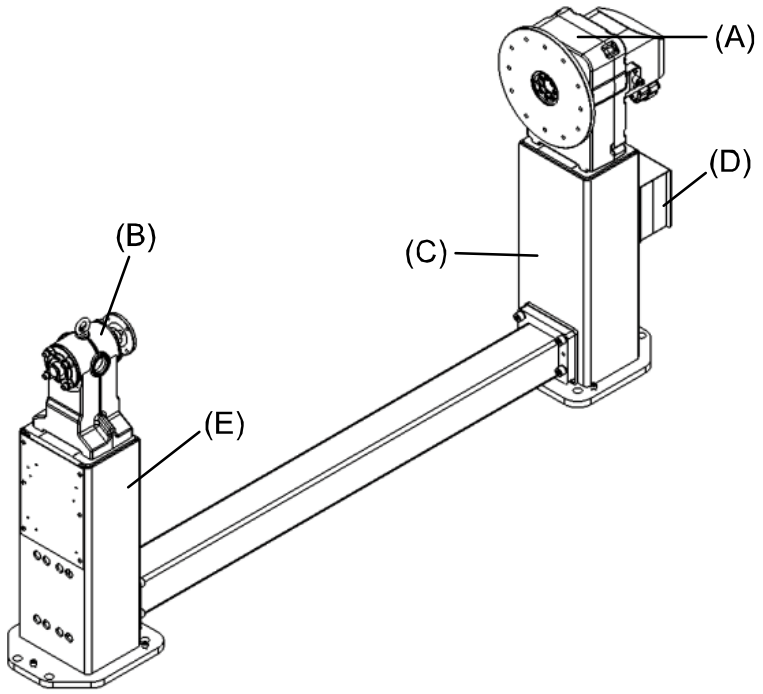
2.5 IRP L-300/ -600/ -1000/ -2000/ -5000

2.5.1 General

Introduction

The positioner is designed to handle workpieces of a weight up to 300/600/1000/2000/5000 kg (including the fixture) in connection with robotprocesses. The modular design, few and heavy-duty moving parts as well as minimal maintenance demands make the positioner service friendly.

The positioner is designed with the following main sections (see Figure below):



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Pos	Description	Pos	Description
A	Rotary unit, PLATE	C	Stand
B	Support bearing	D	SMB unit
E	Tailstock		

There is a rotary unit fitted on the stand.

On the outgoing shaft of the rotary unit (A, PLATE) a faceplate is fitted. The faceplate has plain holes and guide holes for securing fixtures. On the opposite side there is a support collar used for fixture support.

The rotary unit is fitted with a current collector in the form of a slip ring in order to transfer weld current.

The drive equipment for the positioner is placed in the system's equipment cabinet.

2.5.2 Technical data

IRP L-300 / -600 / -1000

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP L-300	IRP L-600	IRP L-1000
Max. handling capacity	300 kg, see load diagram	600 kg, see load diagram	1000 kg, see load diagram
Max. continuous torque	350 Nm	650 Nm	900 Nm
Center of gravity	See load diagram	See load diagram	See load diagram
Max bending moment	650 Nm	3300 Nm	5000 Nm
Positioning time 90 degrees	0.8 -1.2 s	1.0 -1.3 s	1.0 -1.3 s
Positioning time 180 degrees	1.4 -1.9 s	1.5 -2.1 s	1.5 -2.1 s
Positioning time 360 degrees	2.3 -2.7 s	2.7 -3.4 s	2.7 -3.5 s
Repetition accuracy with equal loads and radius 500 mm	±0.05 mm	±0.05 mm	±0.05 mm
Max. speed of rotation	180 deg/s	150 deg/s	150 deg/s
Max welding current, 60% duty cycle	600 Amp	600 Amp	600 Amp
Weight	250 - 300 kg	465 - 515kg	465 - 515kg

IRP L-2000 / -5000

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP L-2000	IRP L-5000
Max. handling capacity	2000 kg	5000 kg
Max continuous torque	3800 Nm	9000 Nm
Center of gravity	See load diagram	See load diagram
Max bending moment	15000 Nm	60000 Nm
Positioning time 90 degrees	1.2 - 2.2 s	2.5 - 3.1 s
Positioning time 180 degrees	2.2 - 3.8 s	4.8 - 5.9 s
Positioning time 360 degrees	4.2 - 5.1 s	9.4 - 10.0 s
Repetition accuracy with equal loads and radii 500 mm	±0.05 mm	±0.05 mm
Max. speed of rotation	90deg/s	39 deg/s
Max welding current, 60% duty cycle	1200 Amp	1200 Amp
Weight	700 - 740 kg	1800 kg

2.5.3 Loading diagram

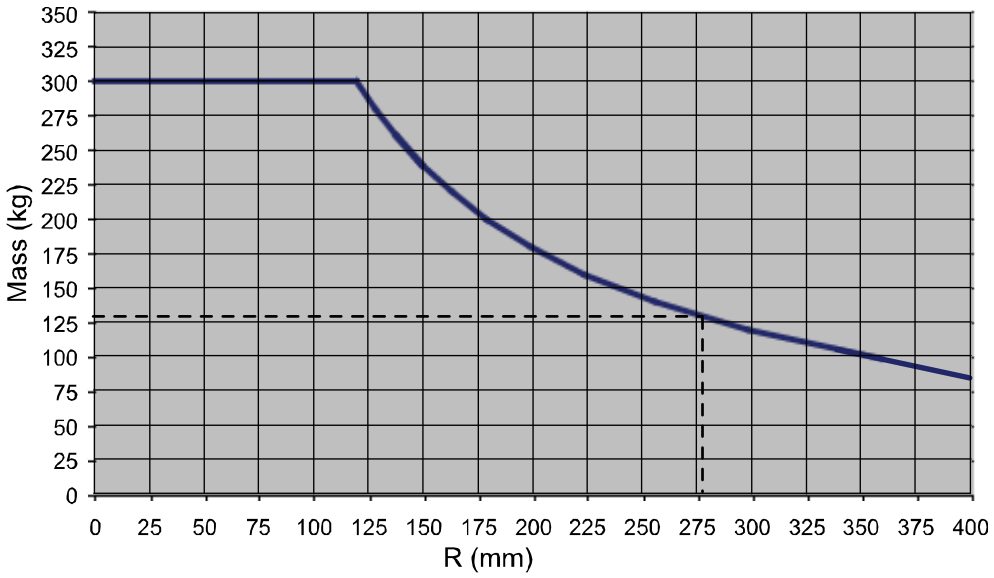
General

The diagrams (Figures below) show the maximum permitted center of gravity displacement from the center of rotation at different loads.

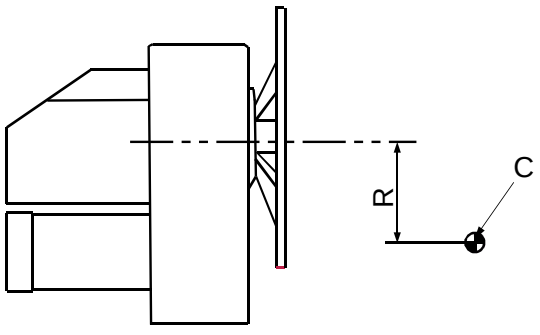
The load refers to the workpiece including the fixture. Also refer to the value for the max. continuous torque.

IRP L-300, with tailstock

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 129 kg.



xx1000000768



xx1000000801

Pos	Description
R	R = Distance in mm
C	Center of gravity

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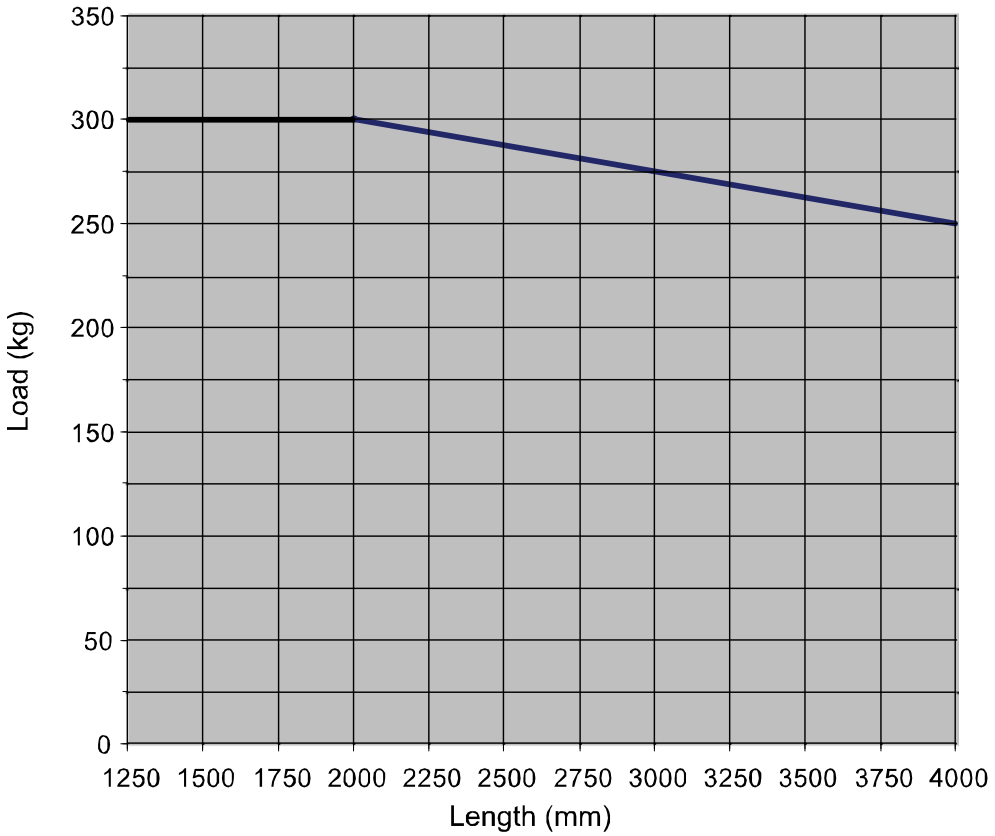
Max load at different length between rotary unit and support collar is shown below.



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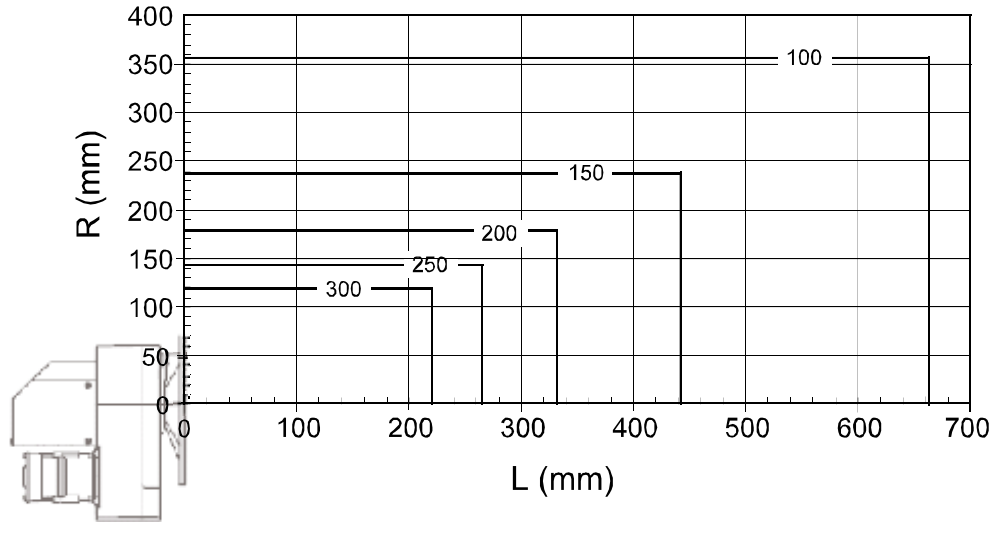
IRP L-300, without tailstock



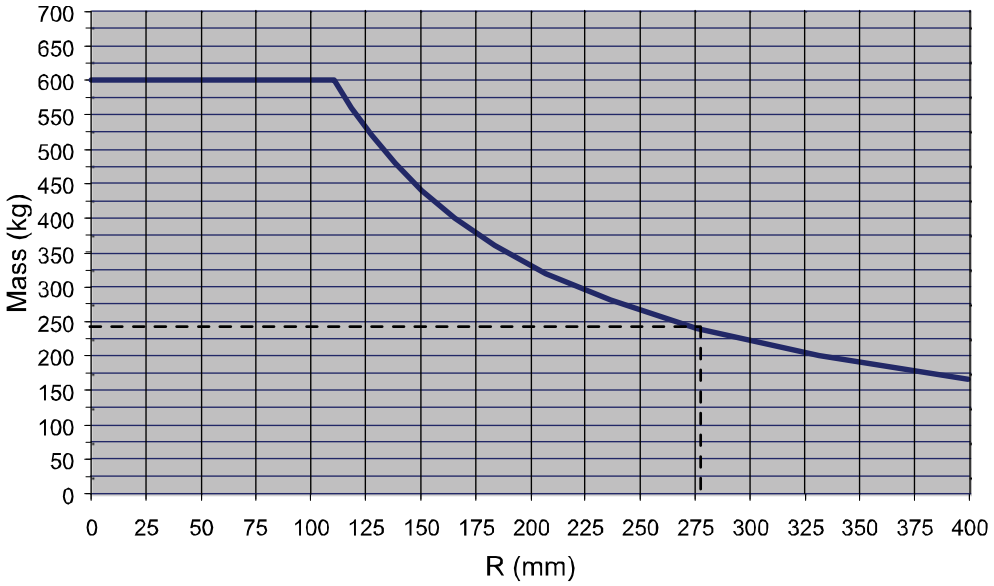
xx1100000011

IRP L-600, with tailstock

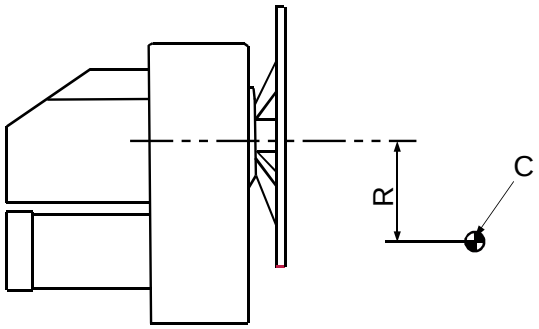
If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 240 kg.

Continues on next page

2.5.3 Loading diagram
Continued



xx1000000775

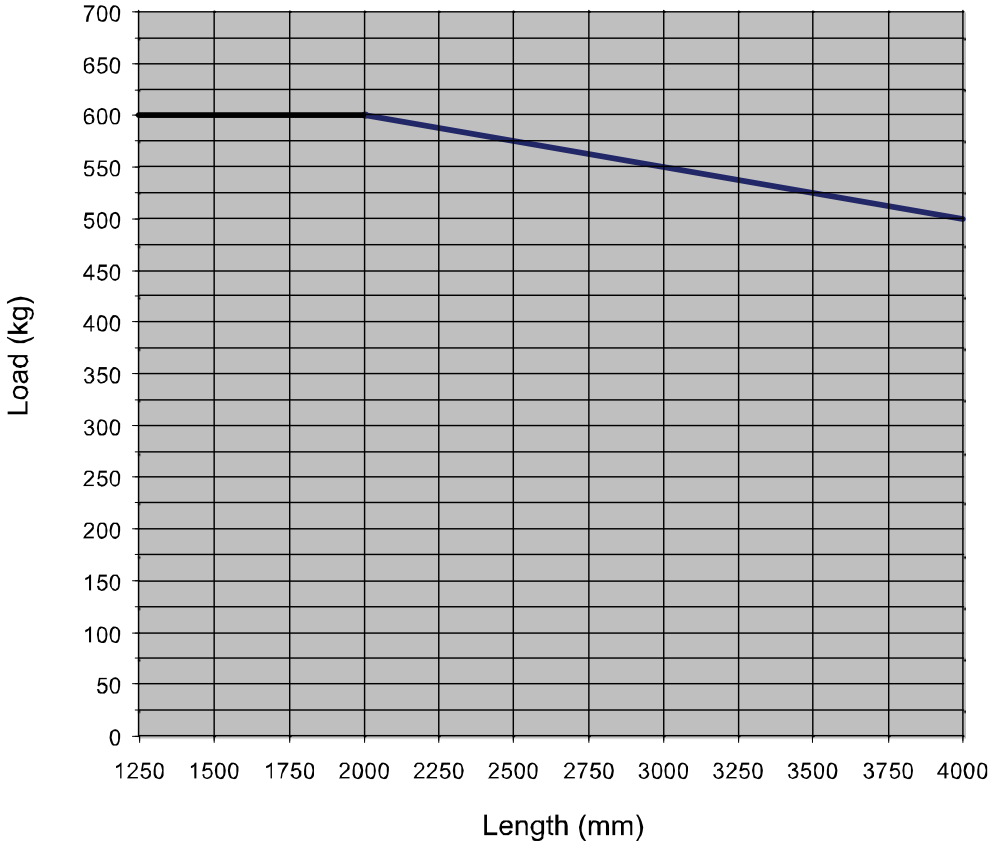


xx1000000801

Pos	Description
R	R = Distance in mm
C	Center of gravity

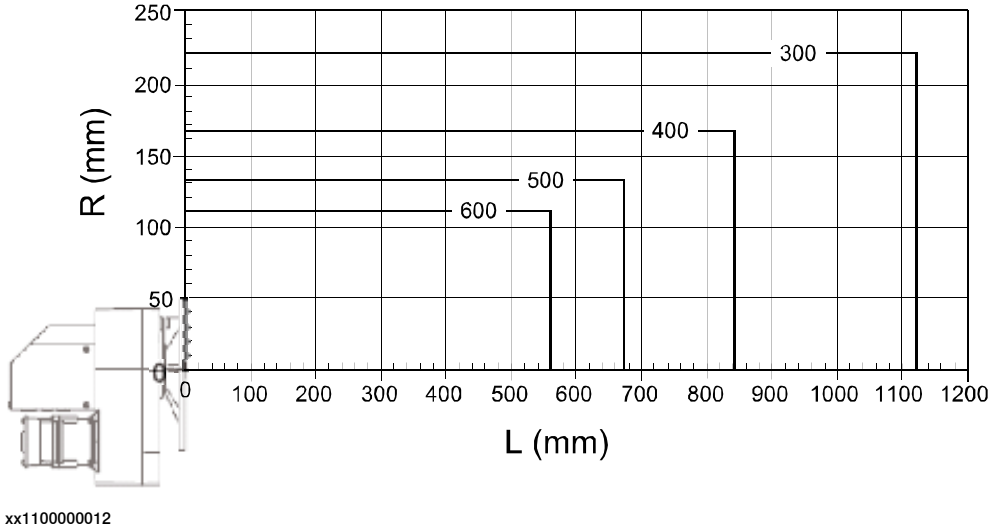
Continues on next page

Max load at different length between rotary unit and support collar is shown below.



xx1000000776

IRP L-600, without tailstock



xx1100000012

IRP L-1000, with tailstock

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 333 kg.

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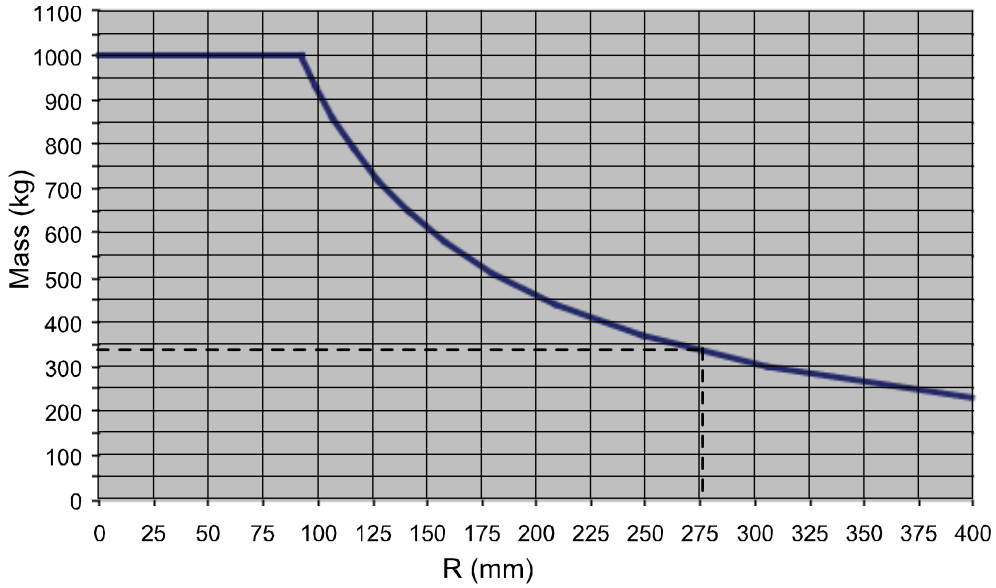
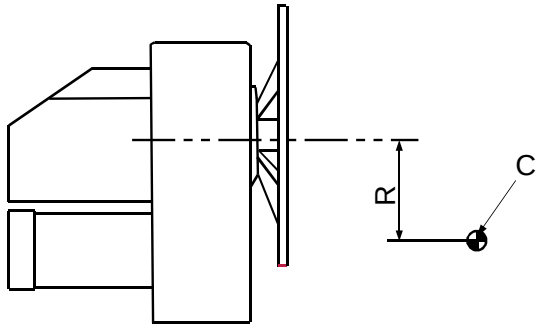
2.5.3 Loading diagram
Continued



xx1000000780

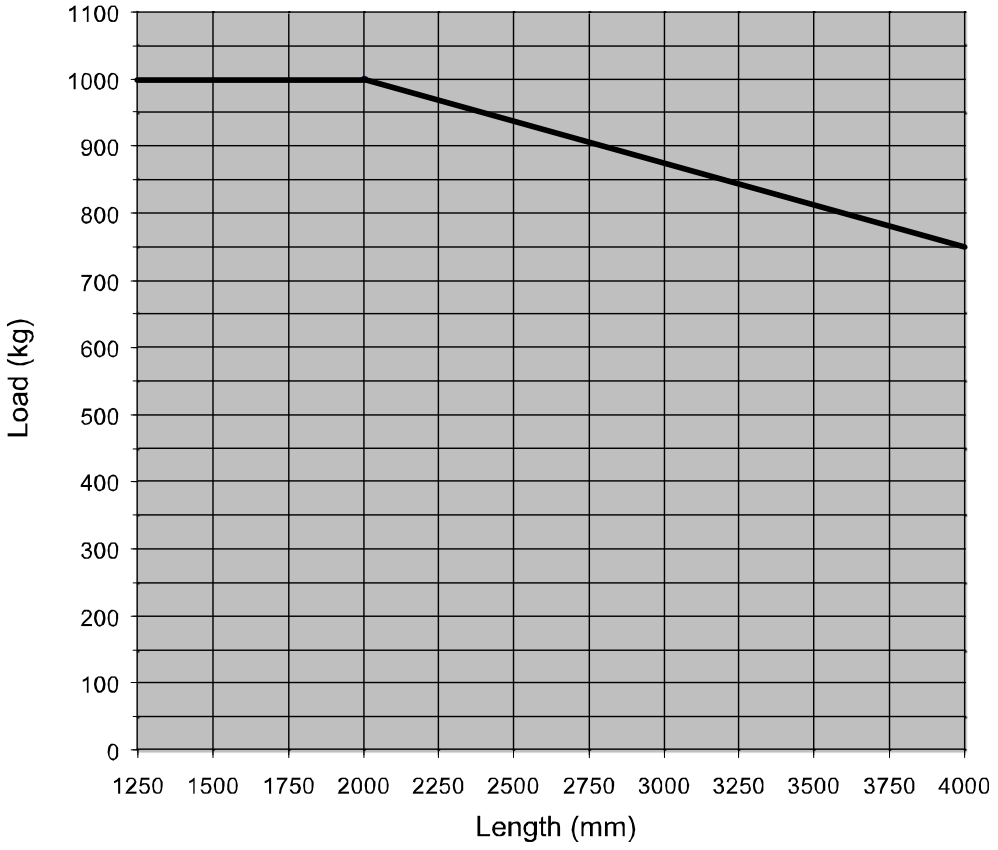


xx1000000801

Pos	Description
R	R = Distance in mm
C	Center of gravity

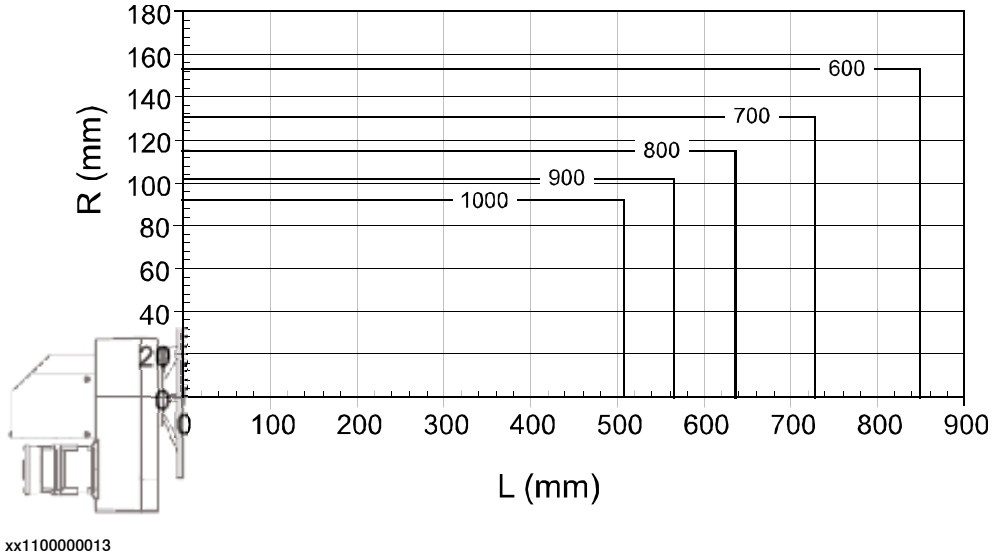
Continues on next page

Max load at different length between rotary unit and support collar is shown below.



xx1000000781

IRP L-1000, without tailstock



xx1100000013

IRP L-2000, with tailstock

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 1400 kg.

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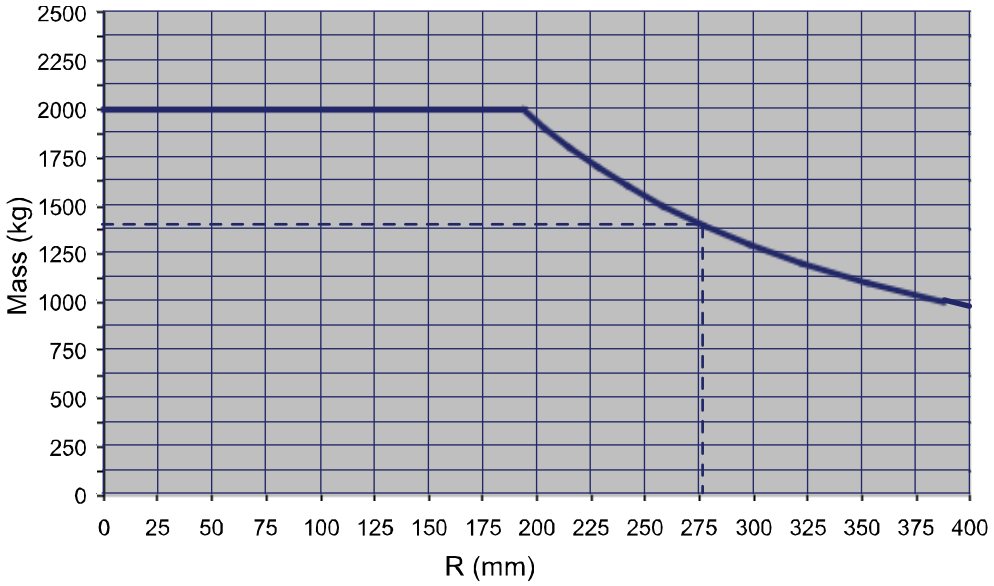
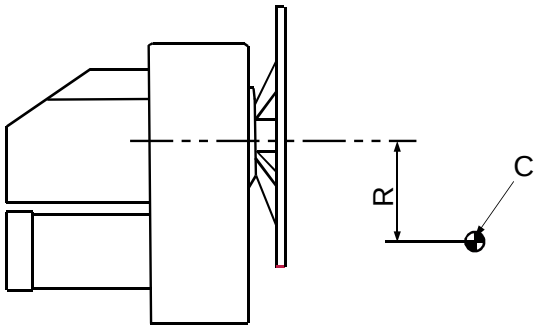
2.5.3 Loading diagram
Continued



xx1000000785

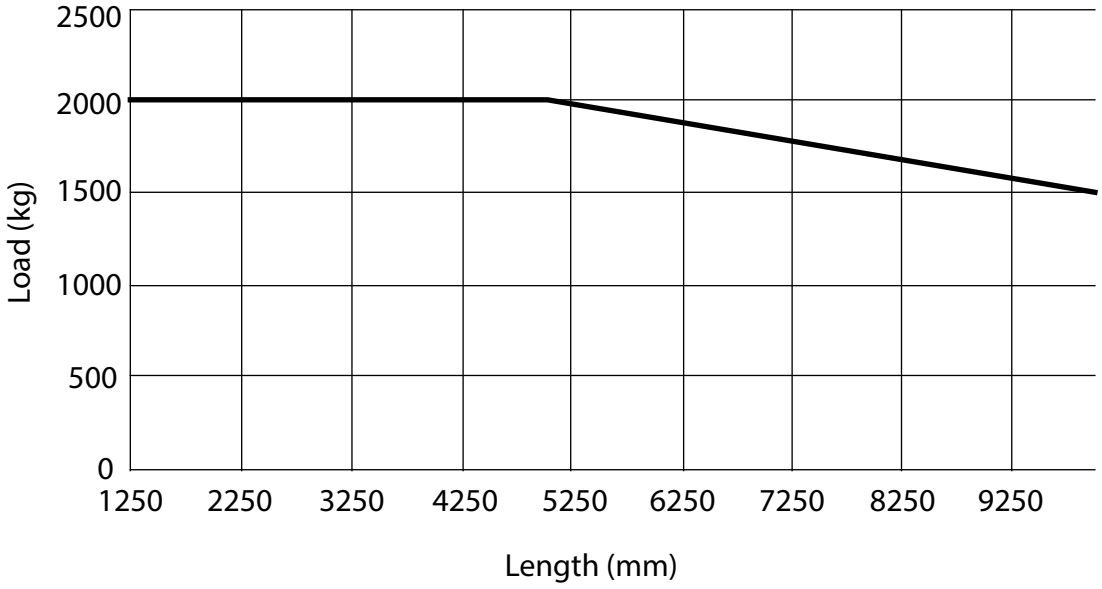


xx1000000801

Pos	Description
R	R= Distance in mm
C	Center of gravity

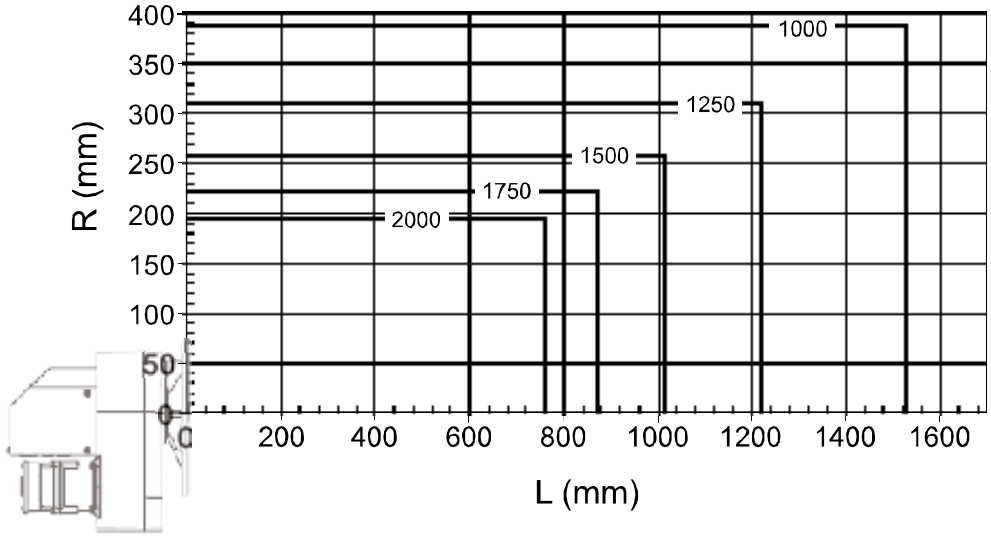
Max load at different length between rotary unit and support collar is shown below.

Continues on next page



xx1500003014

IRP L-2000, without tailstock



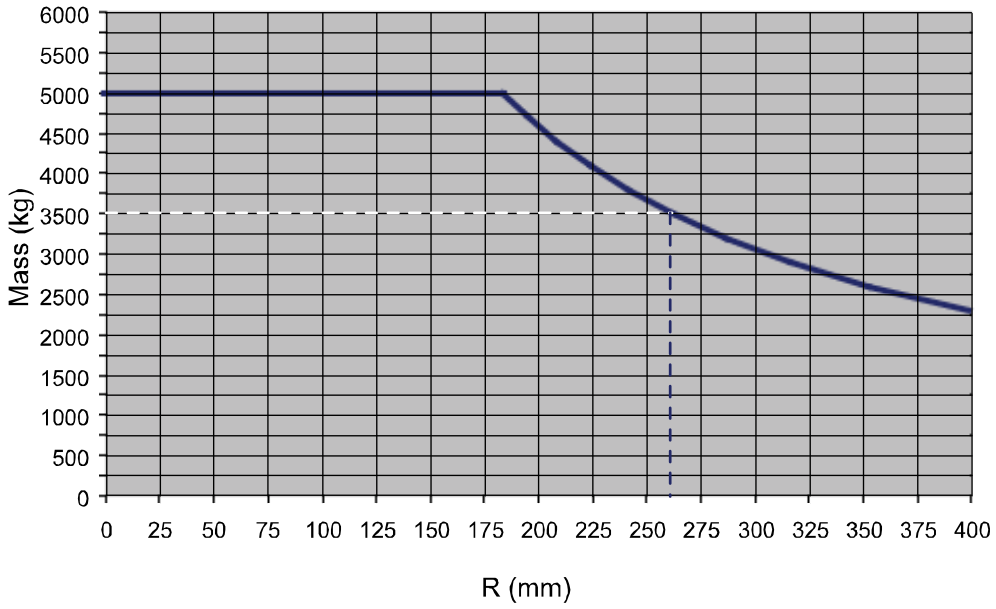
xx1100000014

IRP L-5000, with tailstock

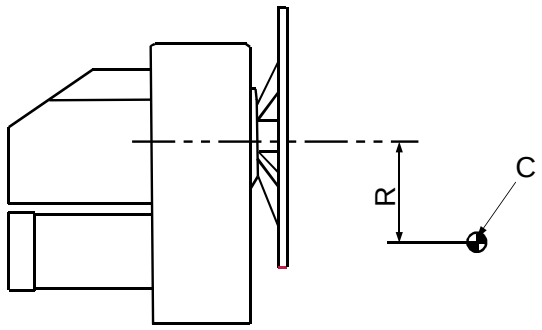
If the center of gravity is placed 262 mm from the center of rotation the load may not be greater than: 3500 kg.

Continues on next page

2.5.3 Loading diagram
Continued



xx1000000786

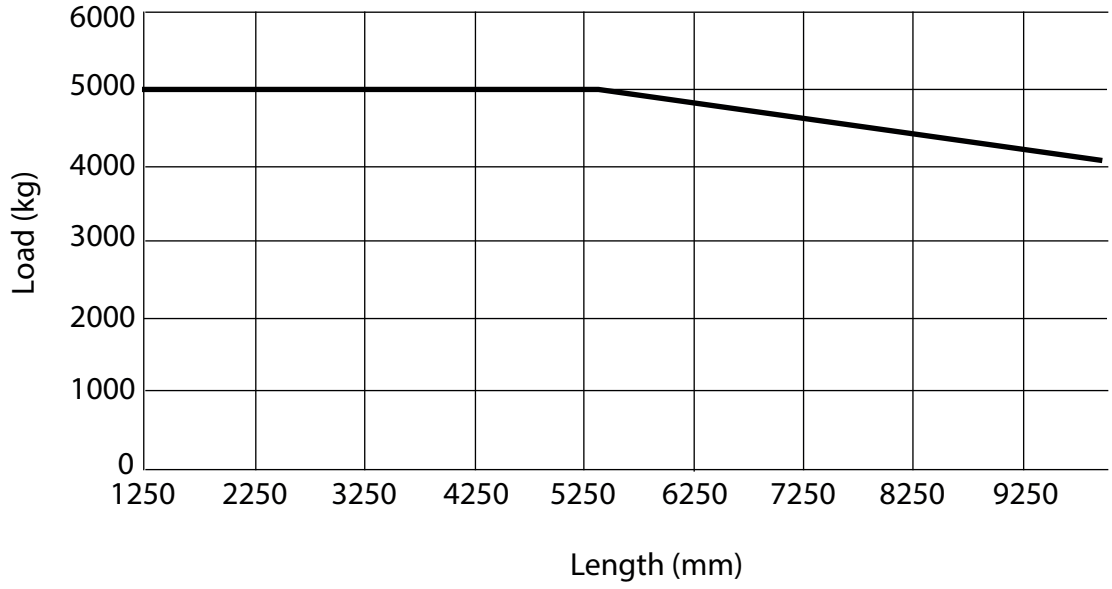


xx1000000801

Pos	Description
R	R= Distance in mm
C	Center of gravity

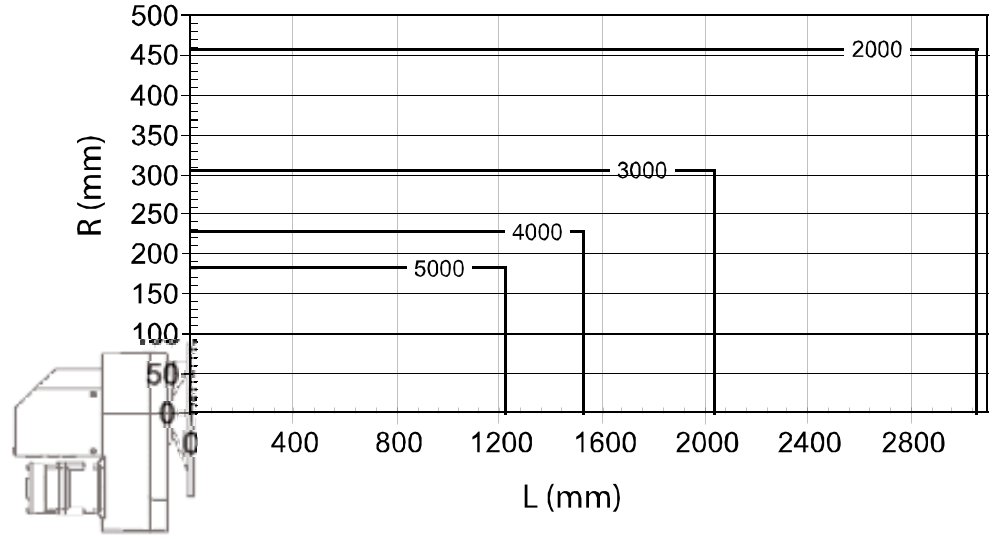
Max load at different length between rotary unit and support collar is shown below.

Continues on next page



xx1500003015

IRP L-5000, without tailstock



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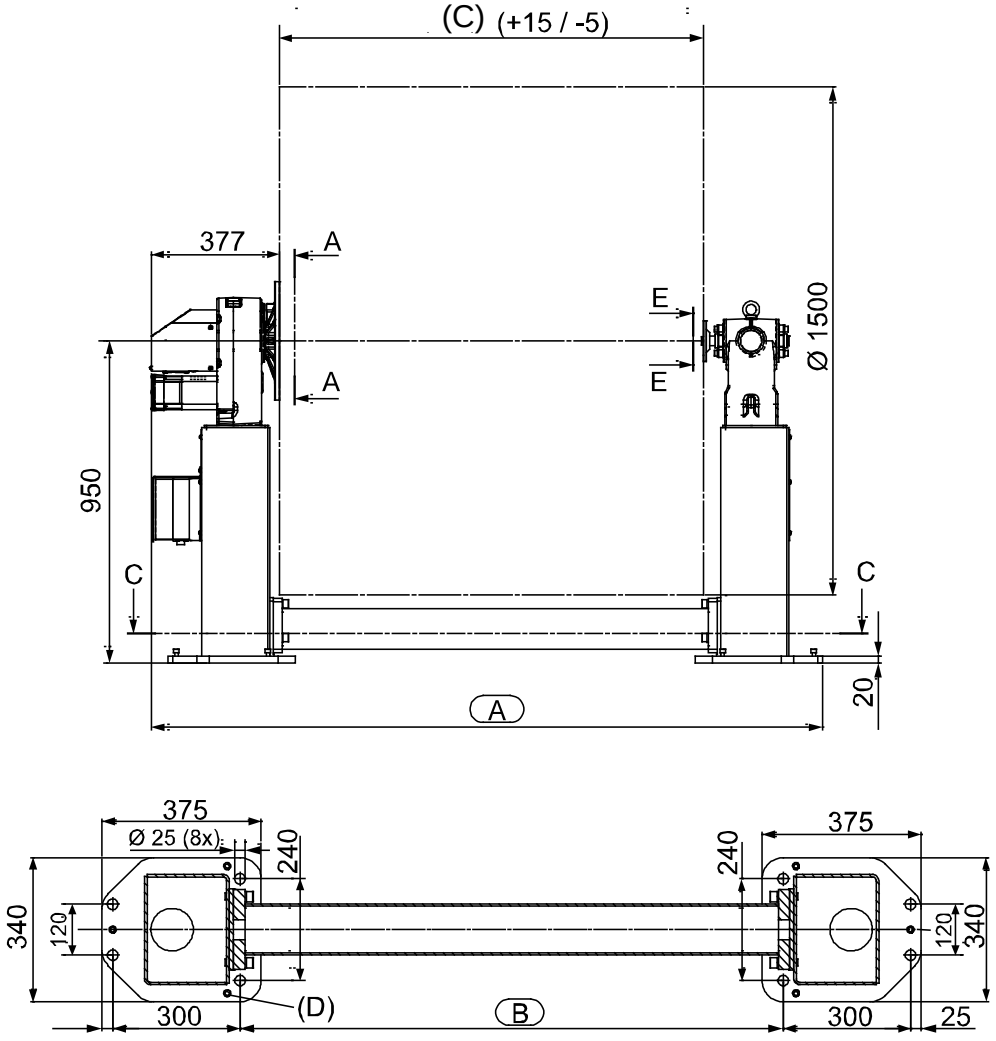
2.5.4 Dimensional drawings

IRP L-300



xx1000000727

Pos	Description
C	Length
D	Adjusting bolts (6x)

IRP L-300 Ø1500		
C (mm)	**A (mm)**	**B (mm)**
1250	1979	1281
1600	2329	1631
2000	2729	2031
2500	3229	2531
3150	3879	3181
4000	4729	4031

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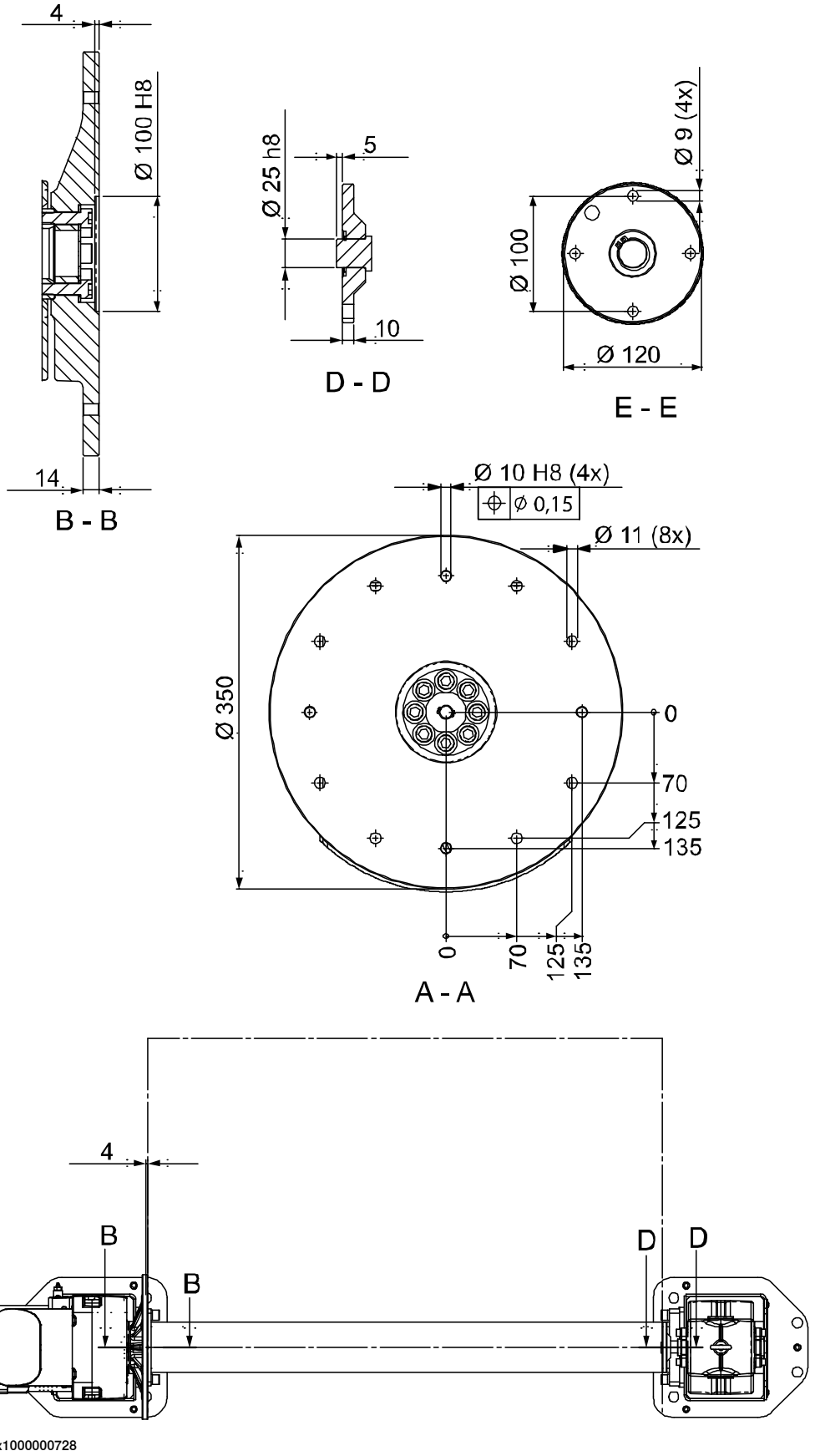

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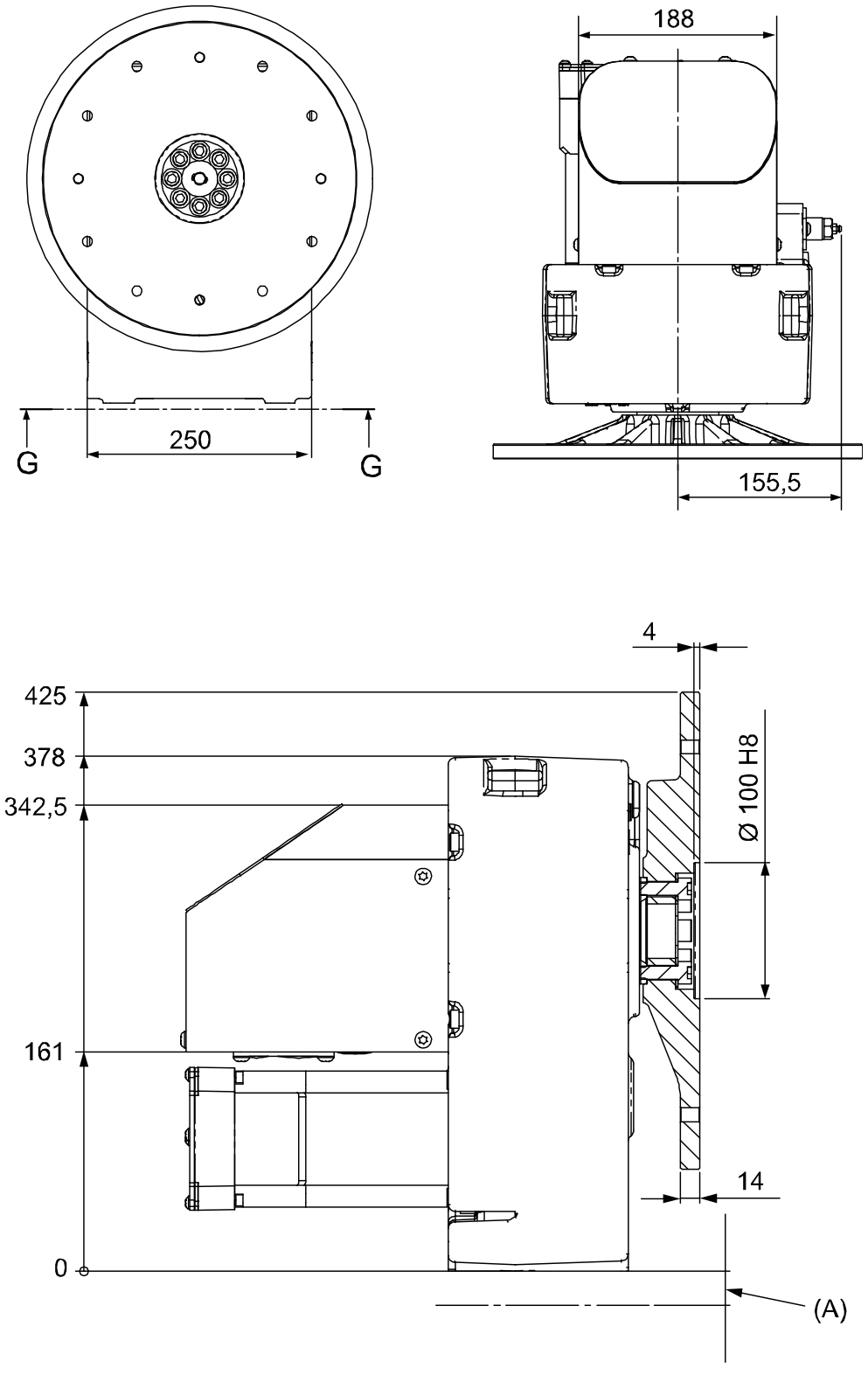
2.5.4 Dimensional drawings
Continued

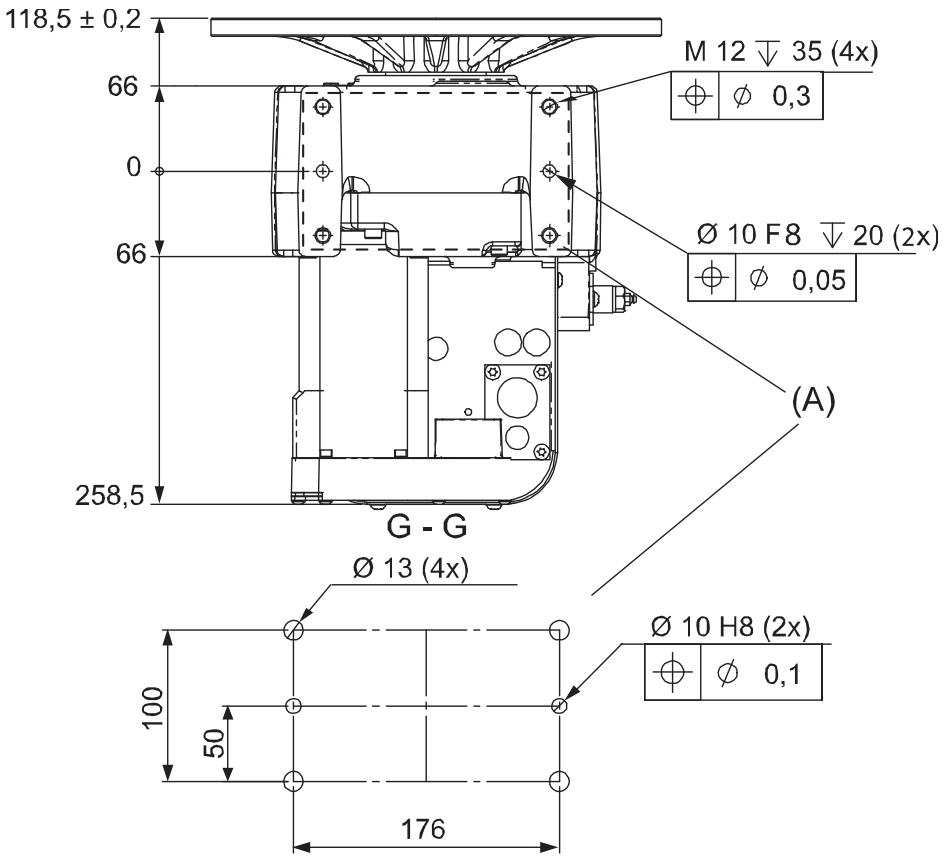
Rotary unit MTD 250



xx1000000729

Pos	Description
A	27 mm Recommended min. clamping length.

Continues on next page



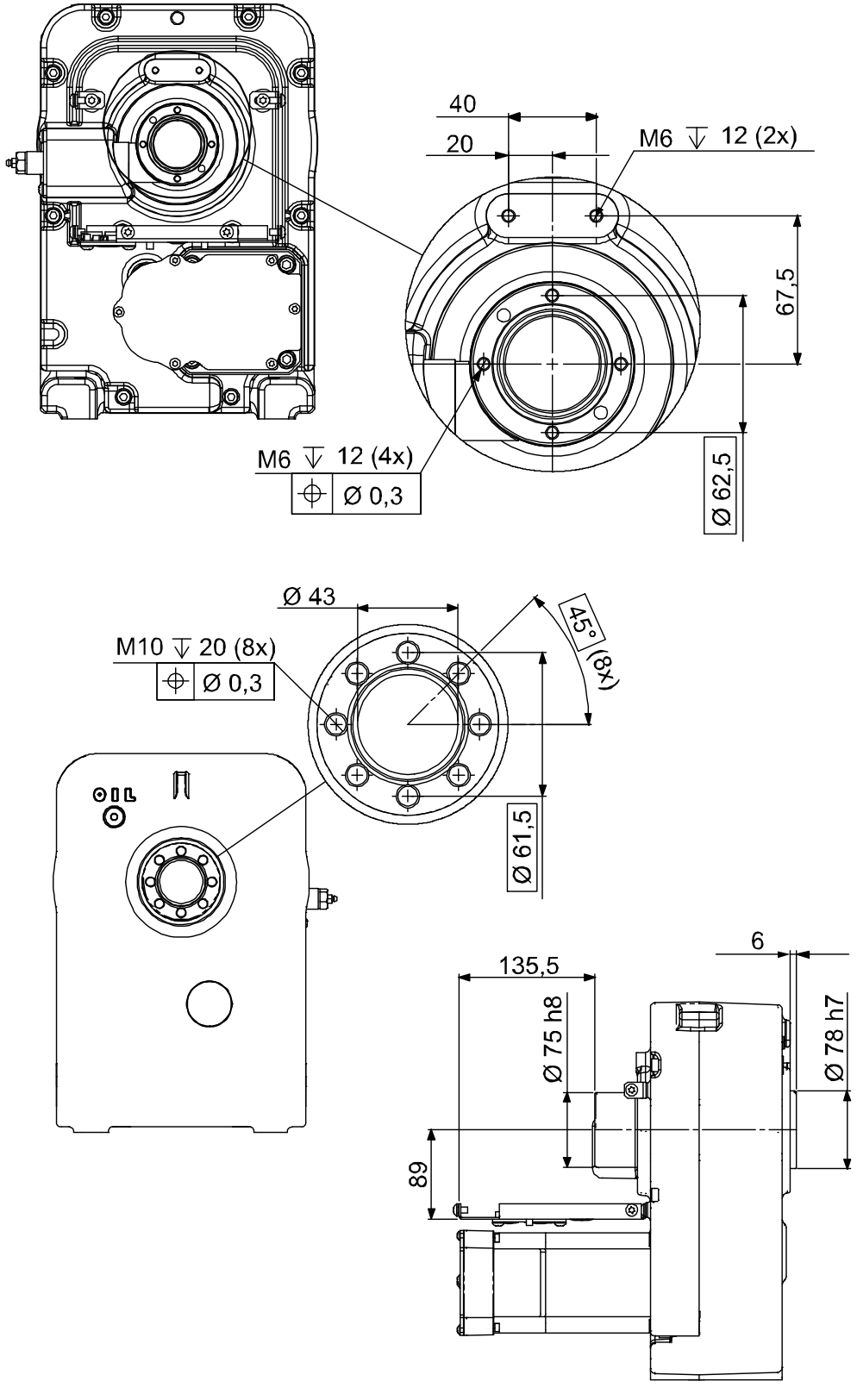
xx1000000730

Pos	Description
A	Hole configuration for mounting base.

Continues on next page

2.5.4 Dimensional drawings

Continued



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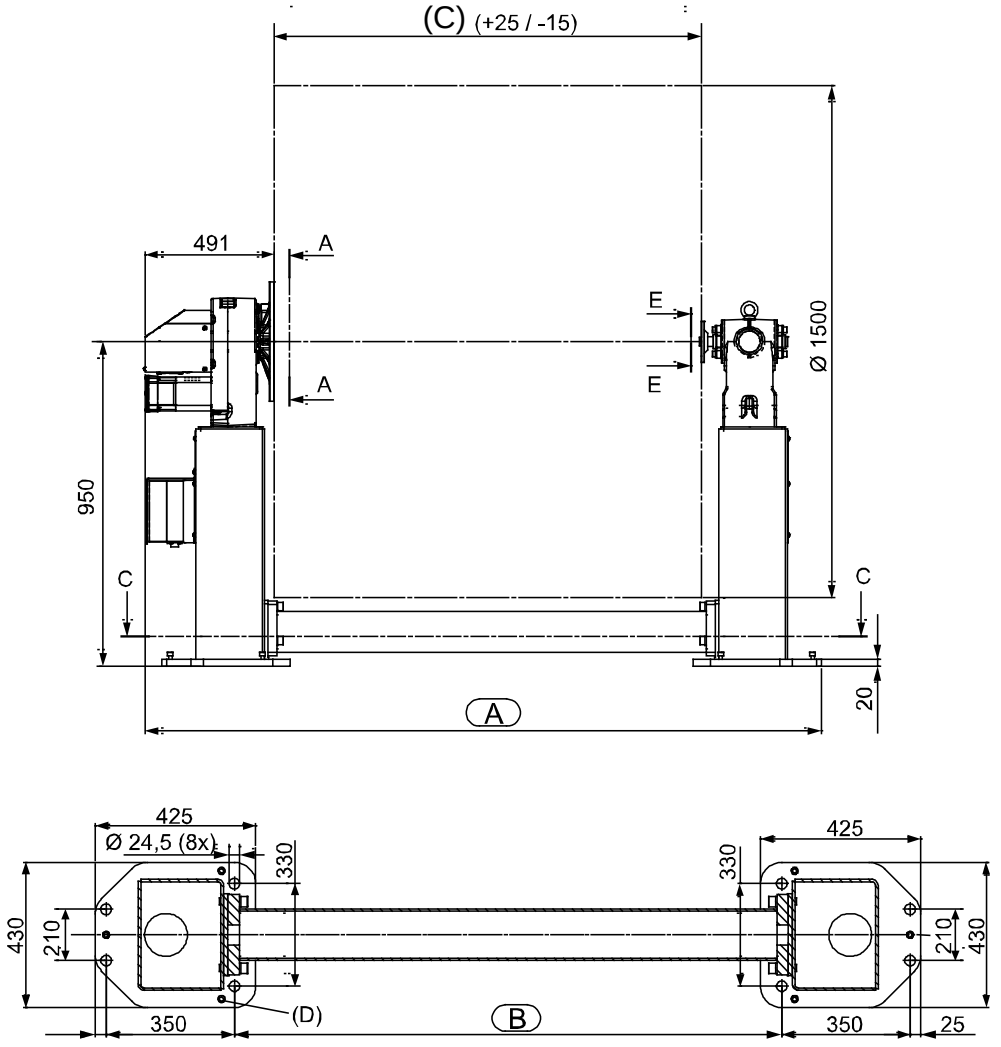
Continues on next page

IRP L-600 / -1000



xx1000000732

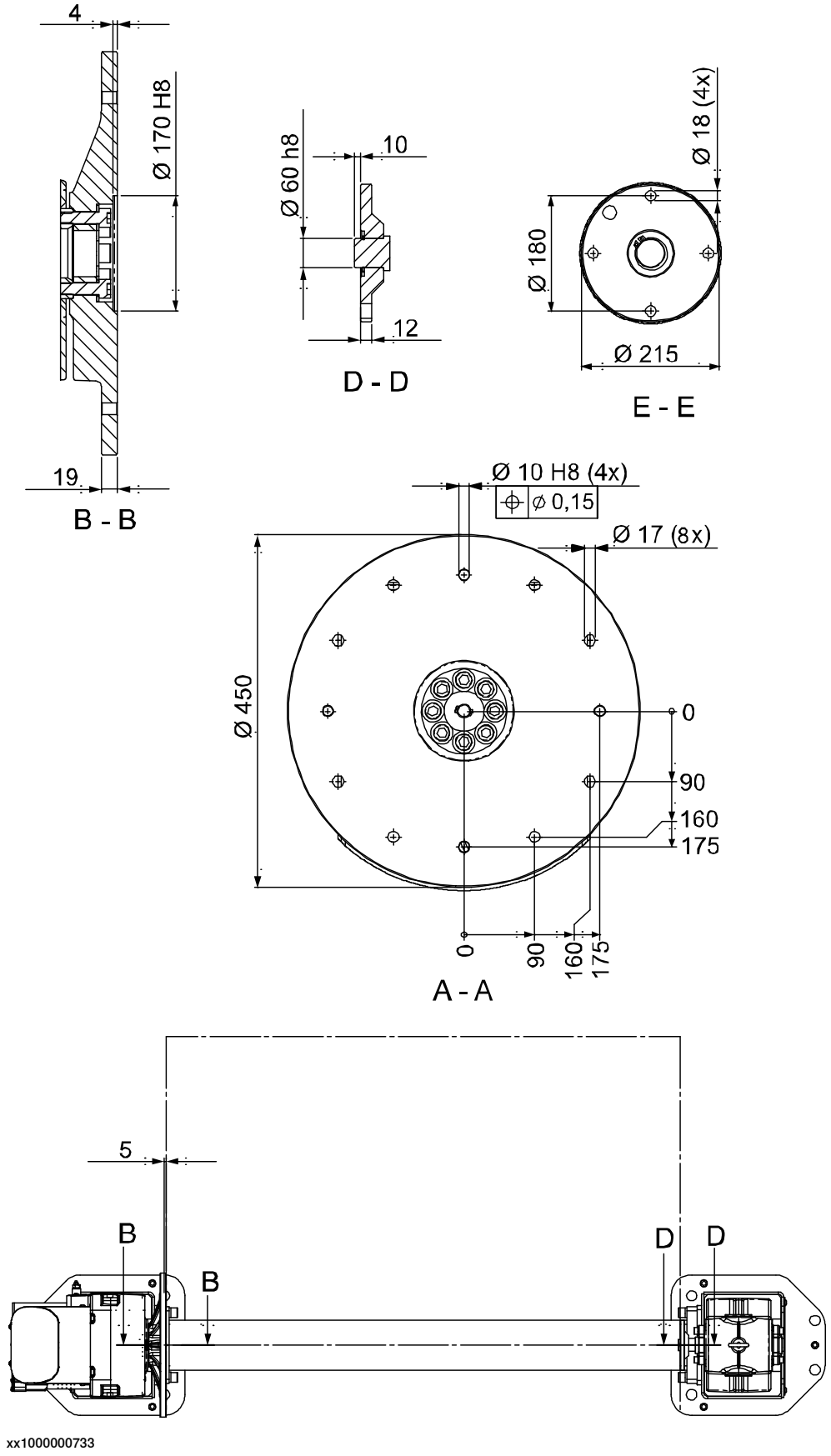
Pos	Description
C	Length
D	Adjusting bolts (6x)

IRP L-600 / -1000 Ø1500		
C (mm)	**A (mm)**	**B (mm)**
1250	2182	1307
1600	2532	1657
2000	2932	2057
2500	3432	2557
3150	4082	3207
4000	4932	4057

Continues on next page

2.5.4 Dimensional drawings

Continued



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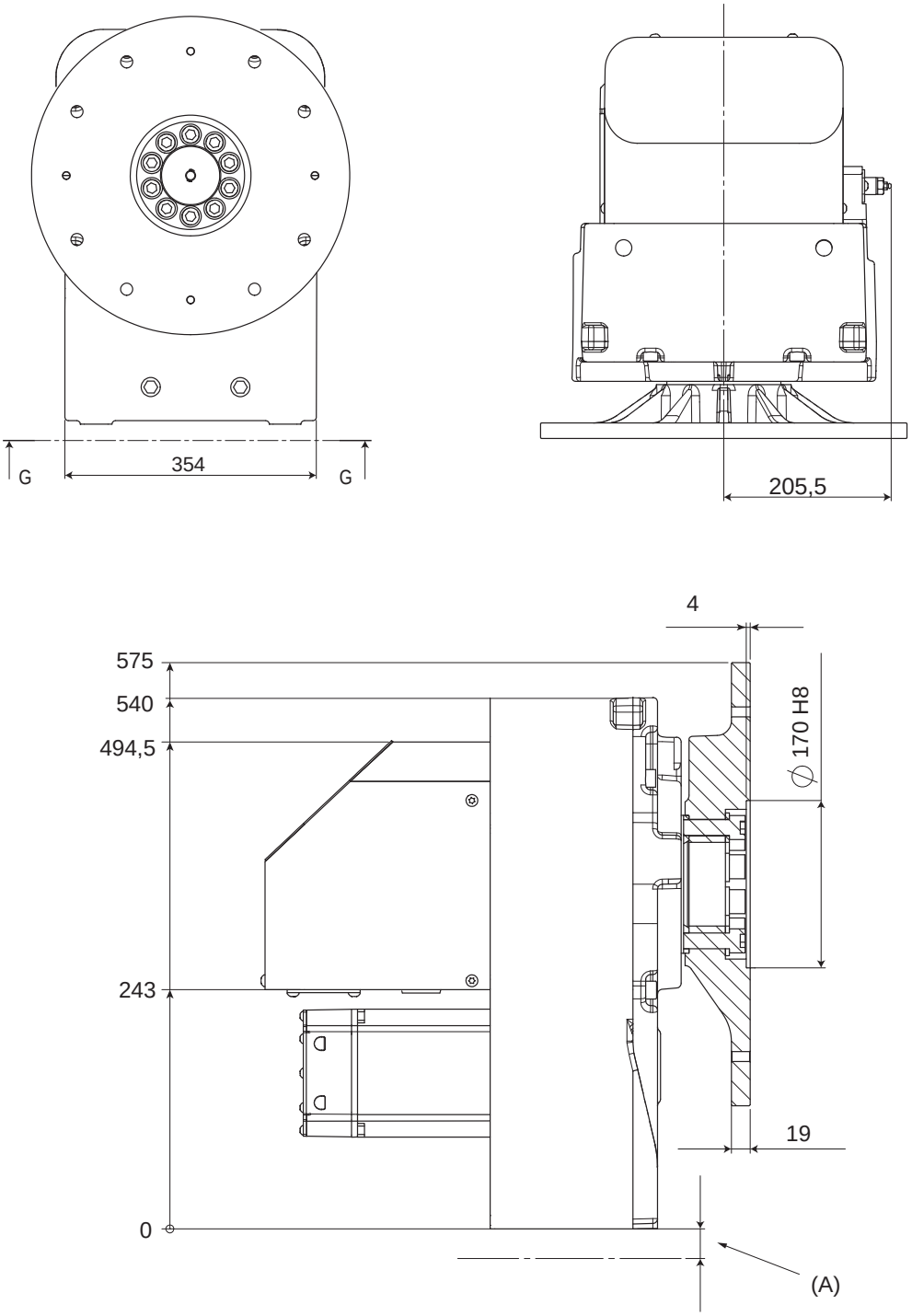
Rotary unit MTD 500/750



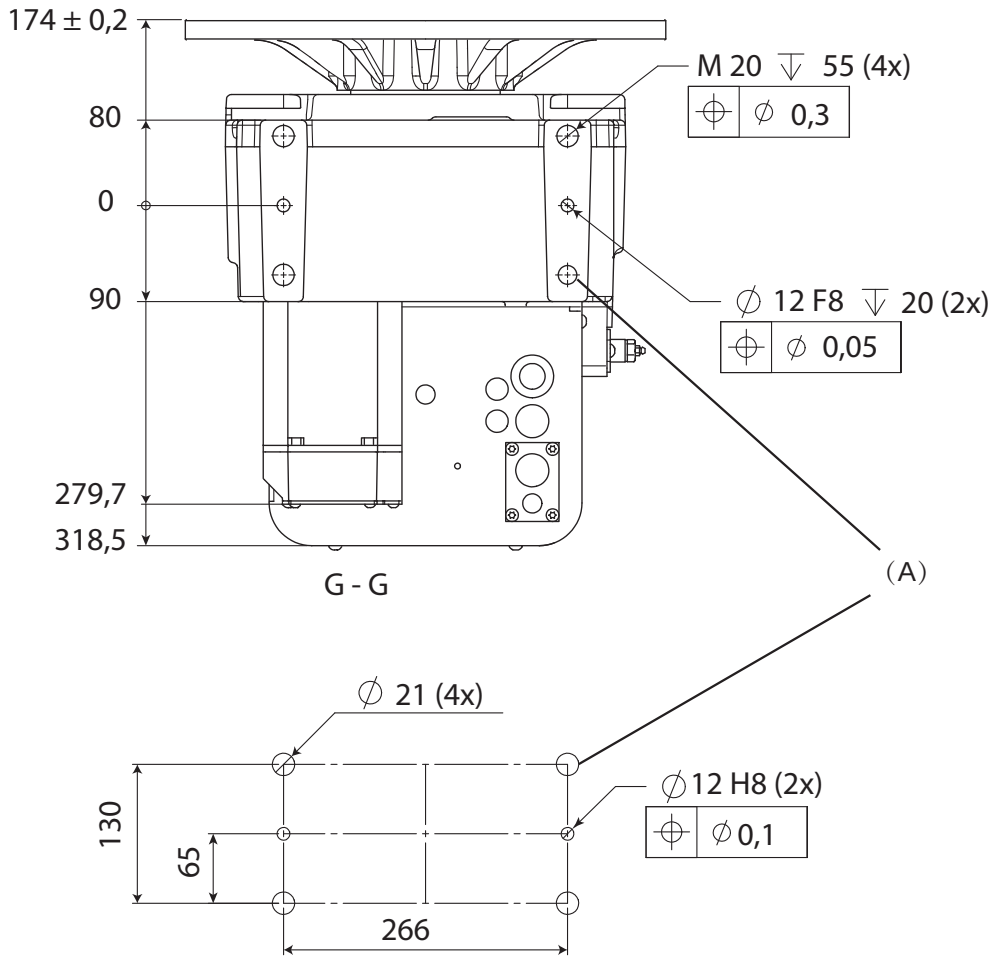
xx1000000734

Pos	Description
A	30 mm Recommended min. clamping length.

Continues on next page

2.5.4 Dimensional drawings

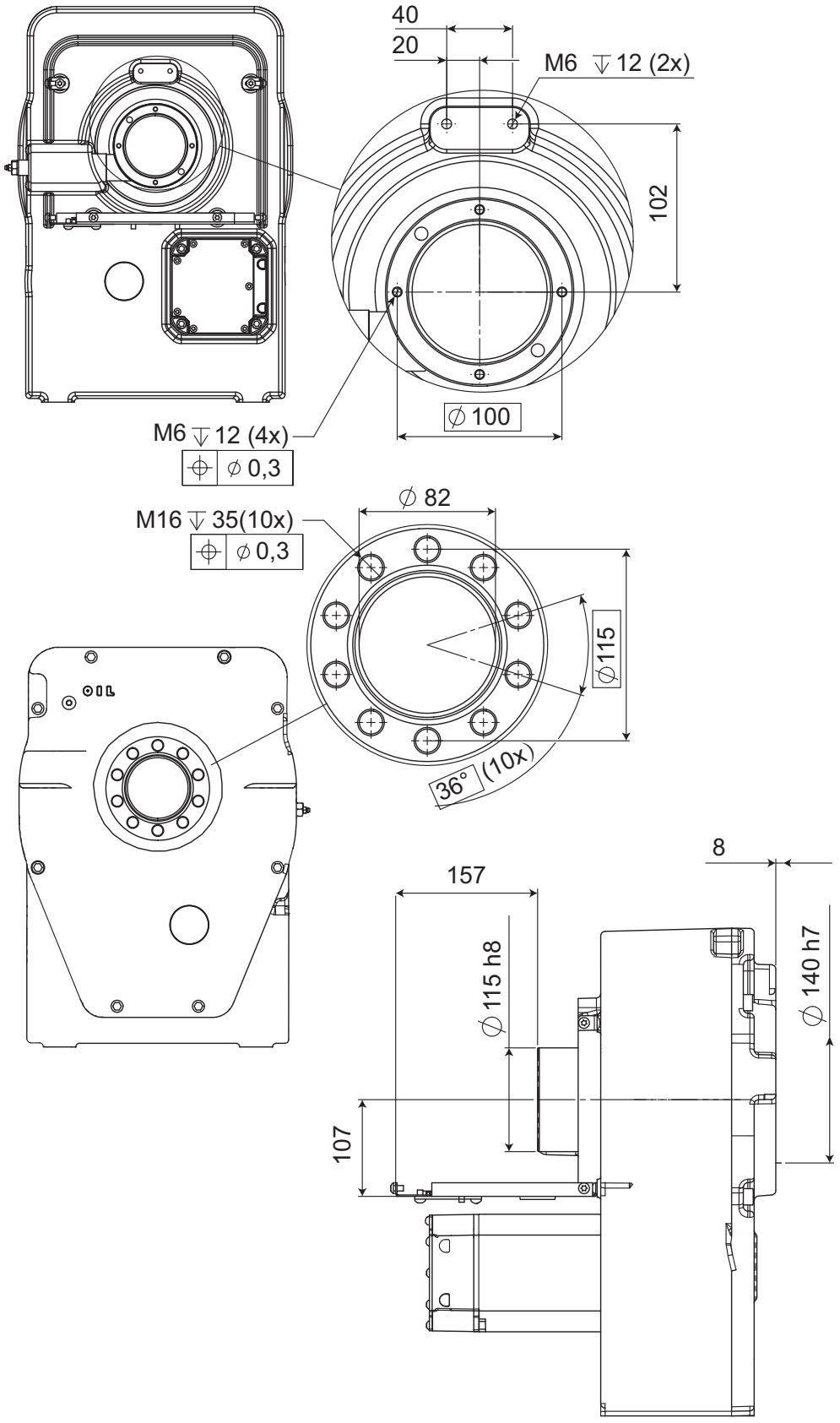
Continued



xx1000000735

Pos	Description
A	Hole configuration for mounting base.

Continues on next page



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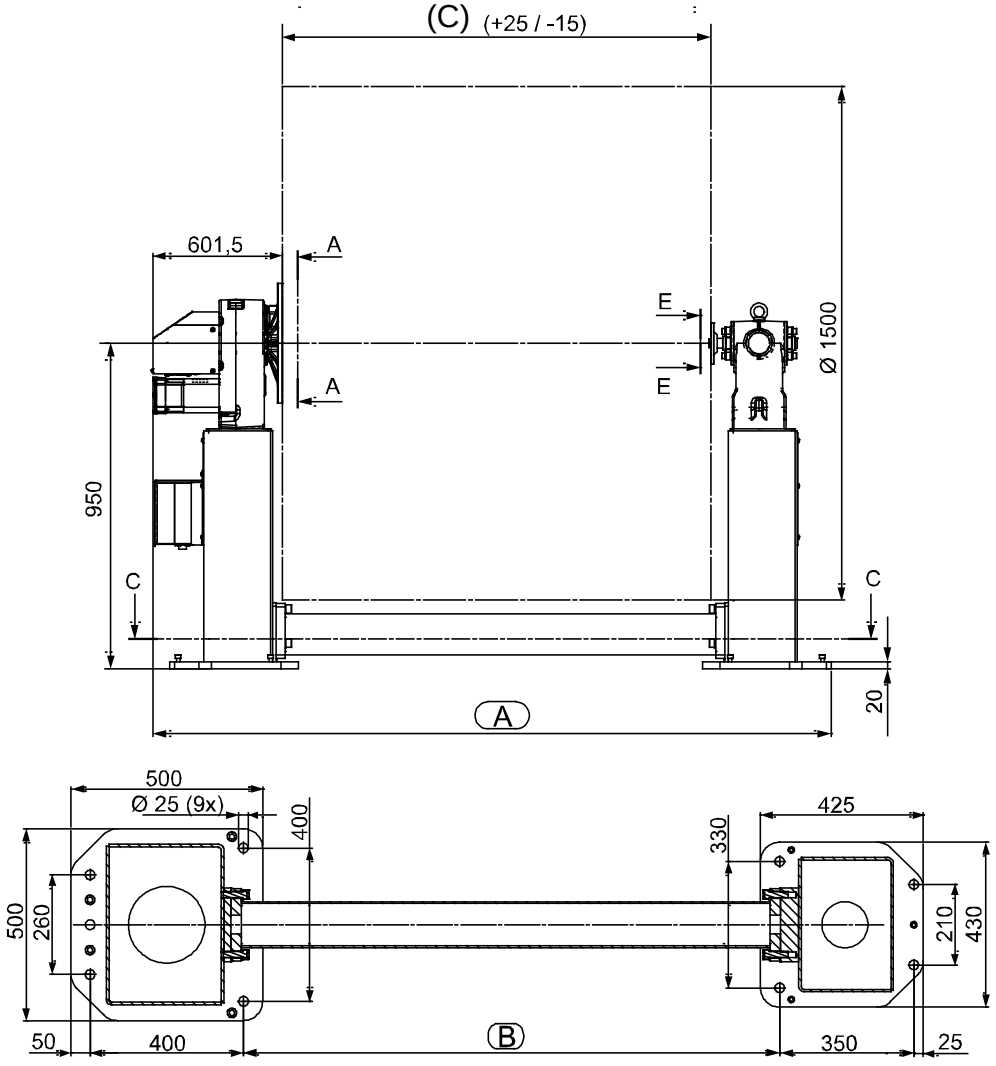
2.5.4 Dimensional drawings
Continued

IRP L-2000

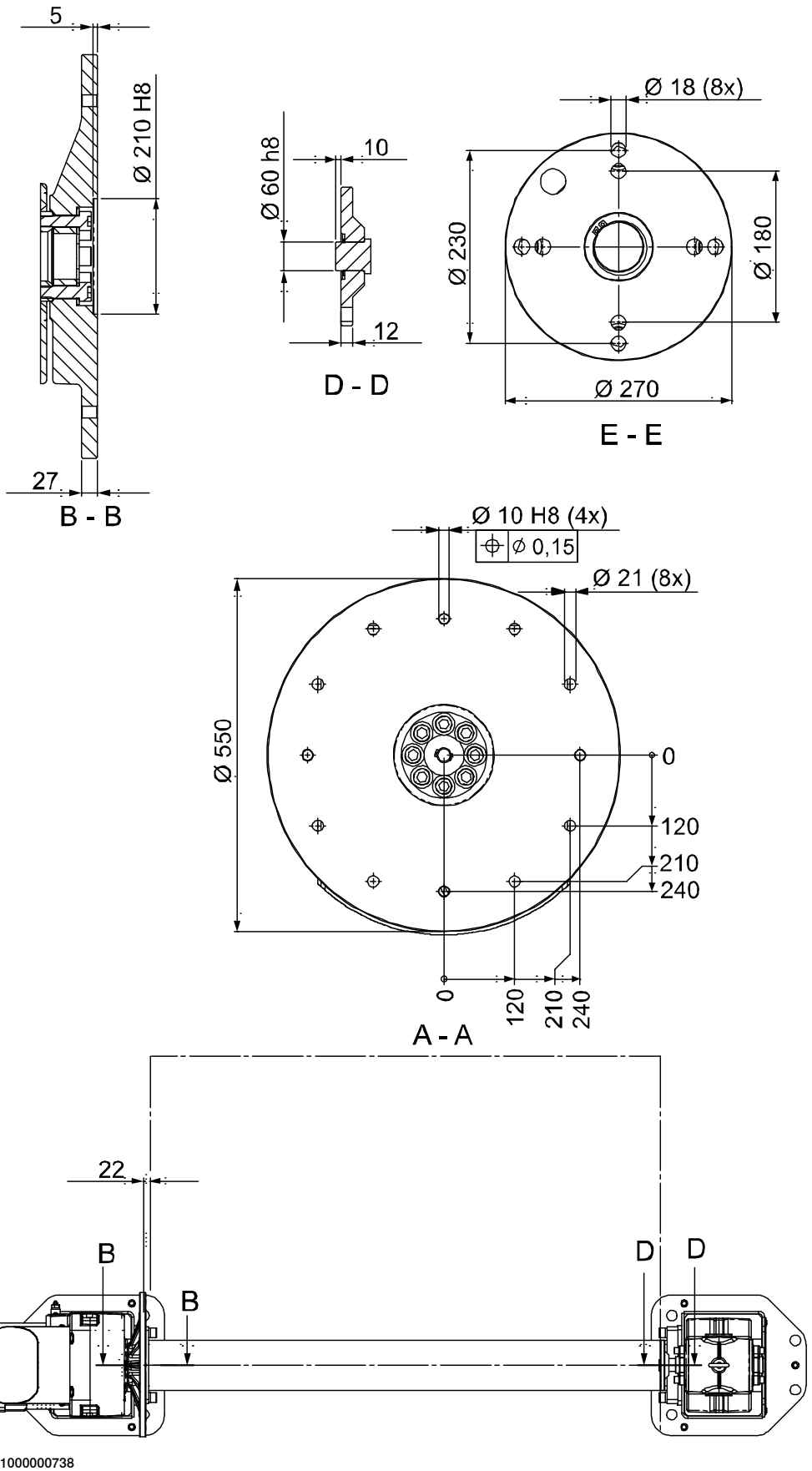


xx1000000737

Pos	Description
C	Length
D	Adjusting bolts (7x)

IRP L-2000 Ø1500		
C (mm)	**A (mm)**	**B (mm)**
1250	2422	1398
1600	2772	1748
2000	3172	2148
2500	3672	2648
3150	4322	3298
4000	5172	4148

Continues on next page



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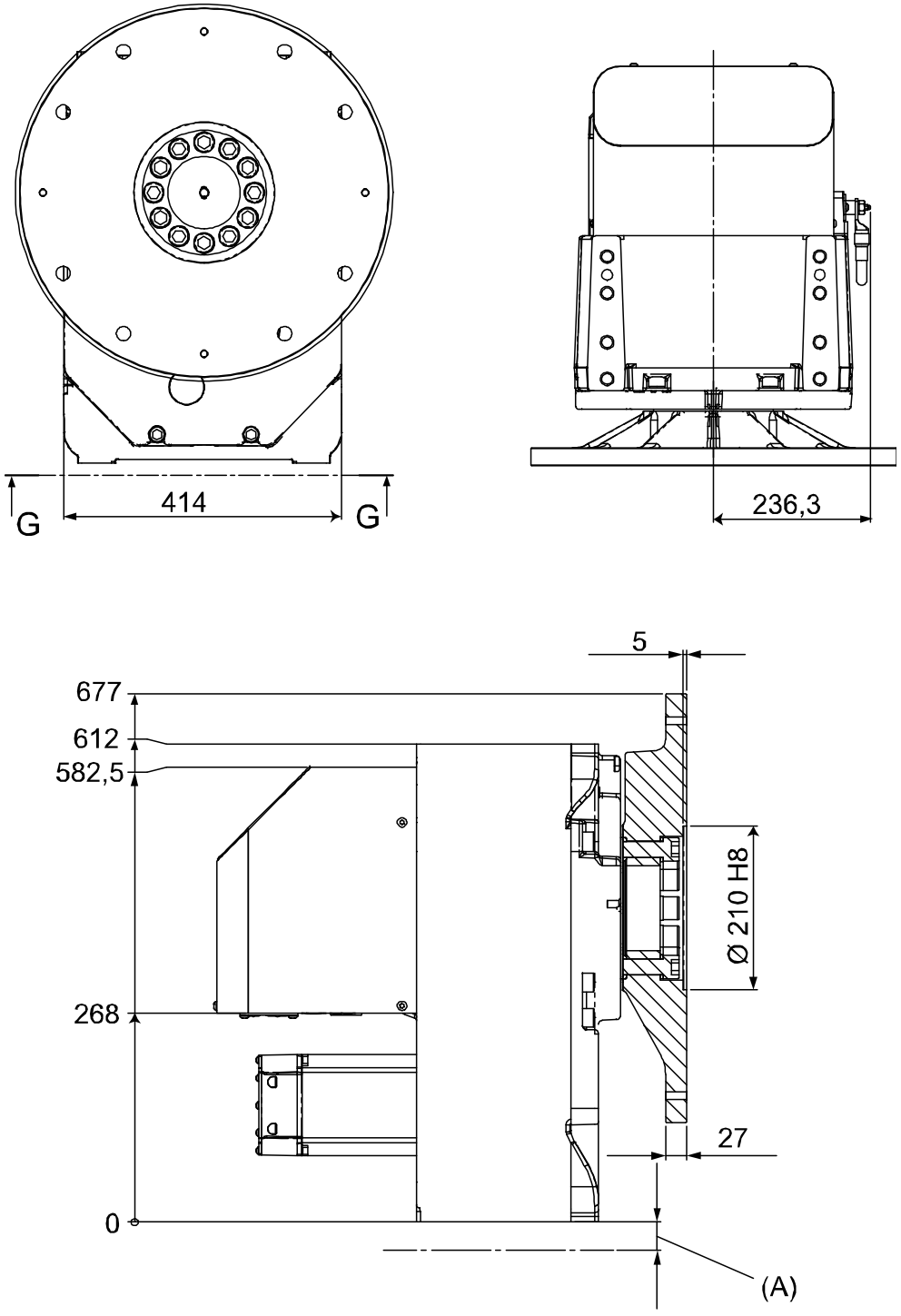
2.5.4 Dimensional drawings
Continued

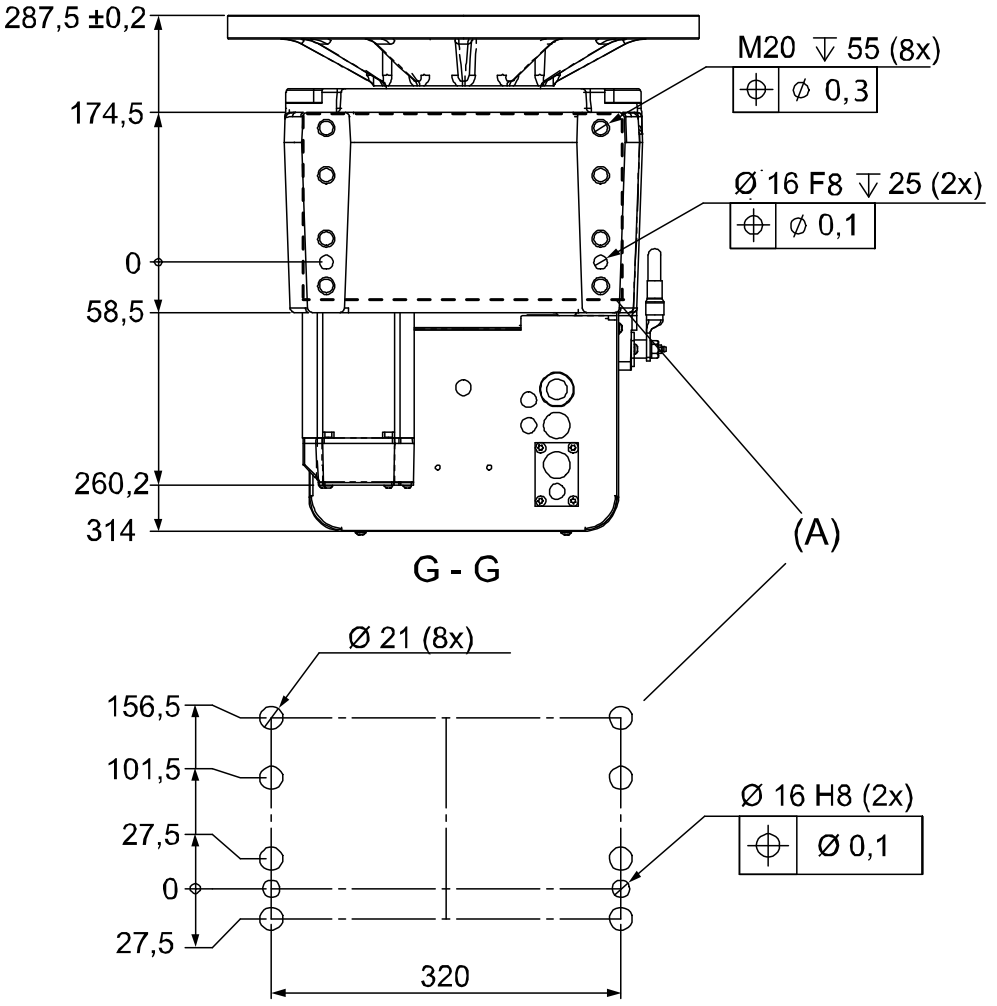
Rotary unit MTD 2000



xx1000000739

Pos	Description
A	36 mm Recommended min. clamping length.

Continues on next page



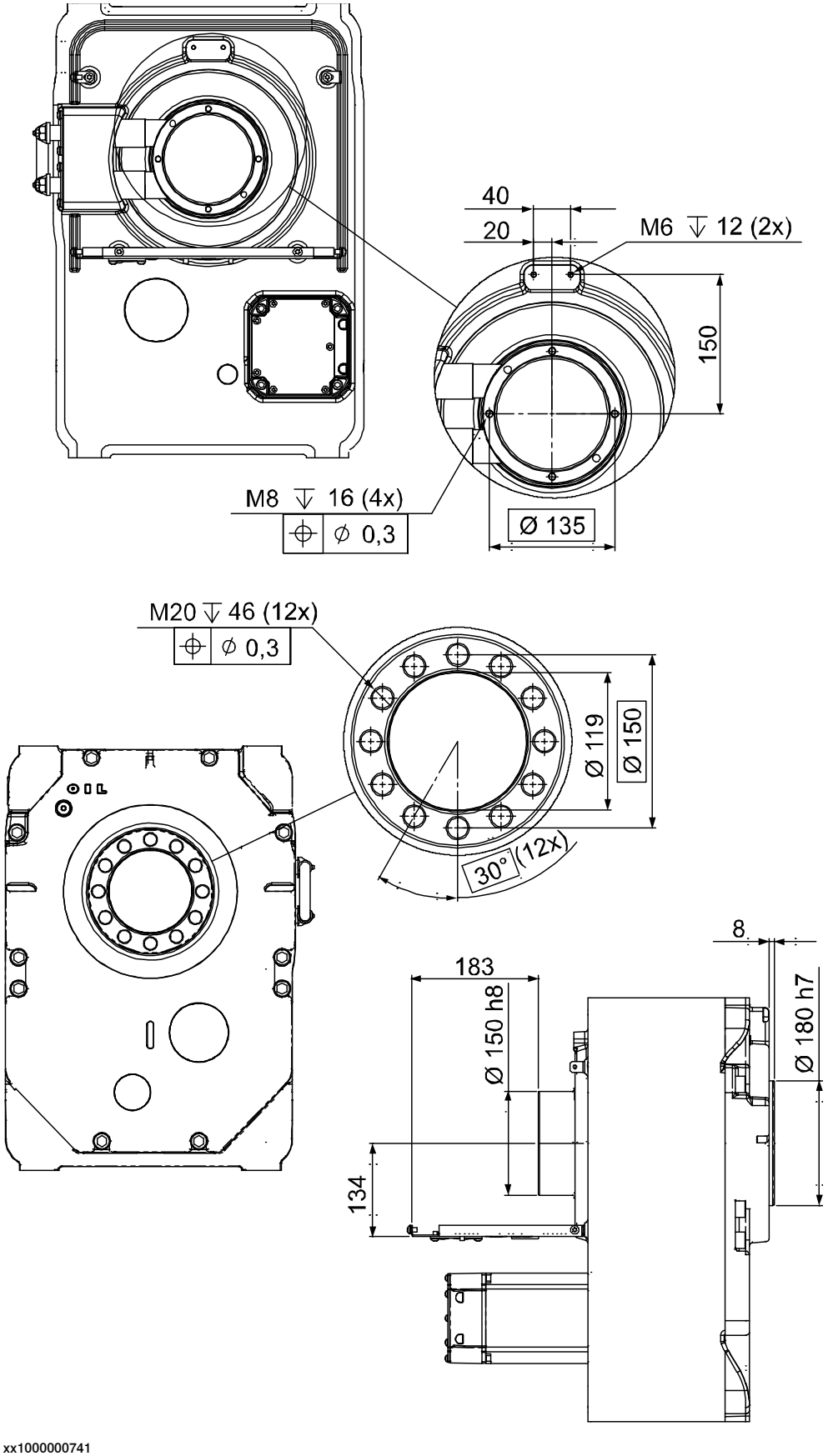
xx1000000740

Pos	Description
A	Hole configuration for mounting base.

Continues on next page

2.5.4 Dimensional drawings

Continued



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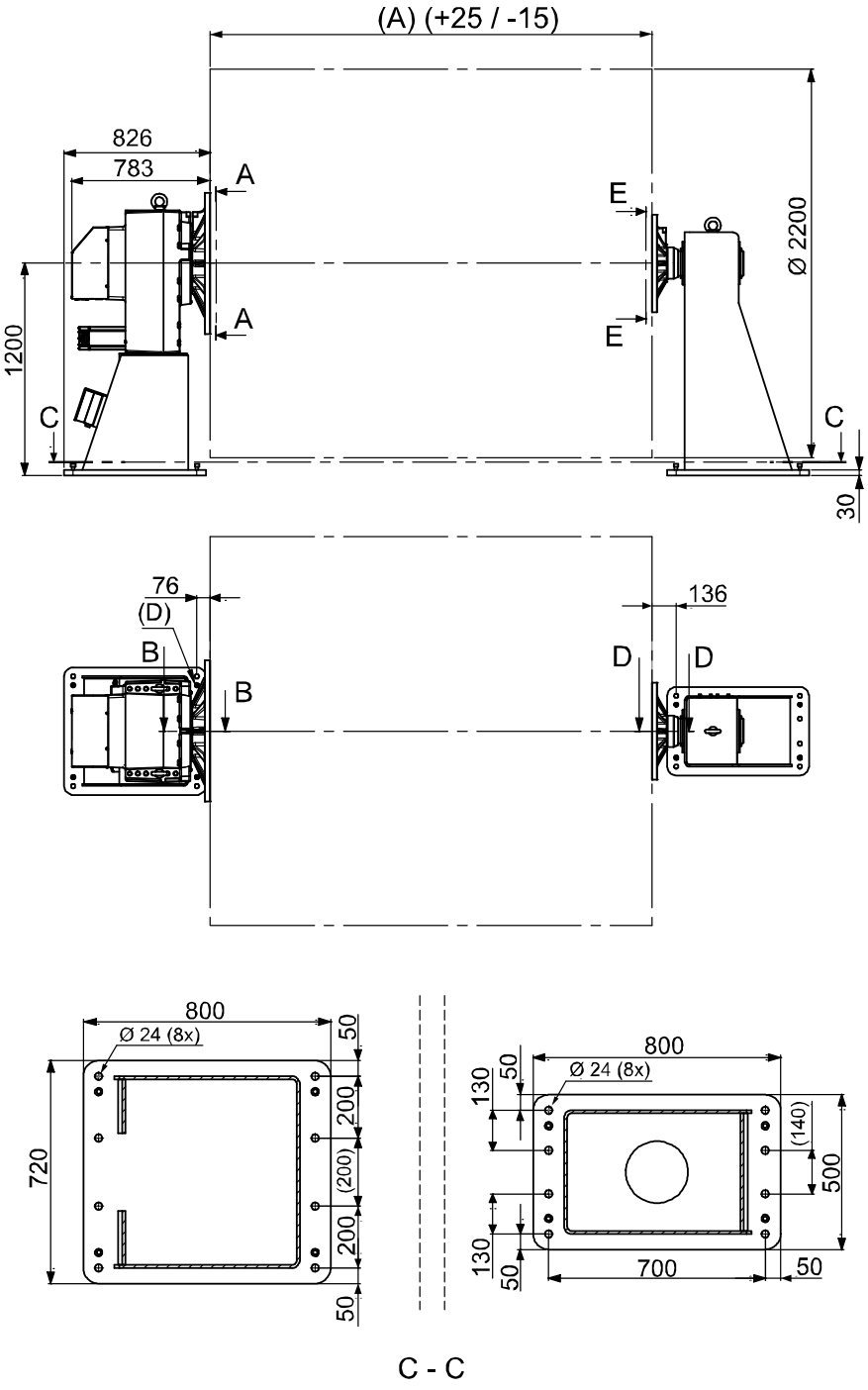
IRP L-5000



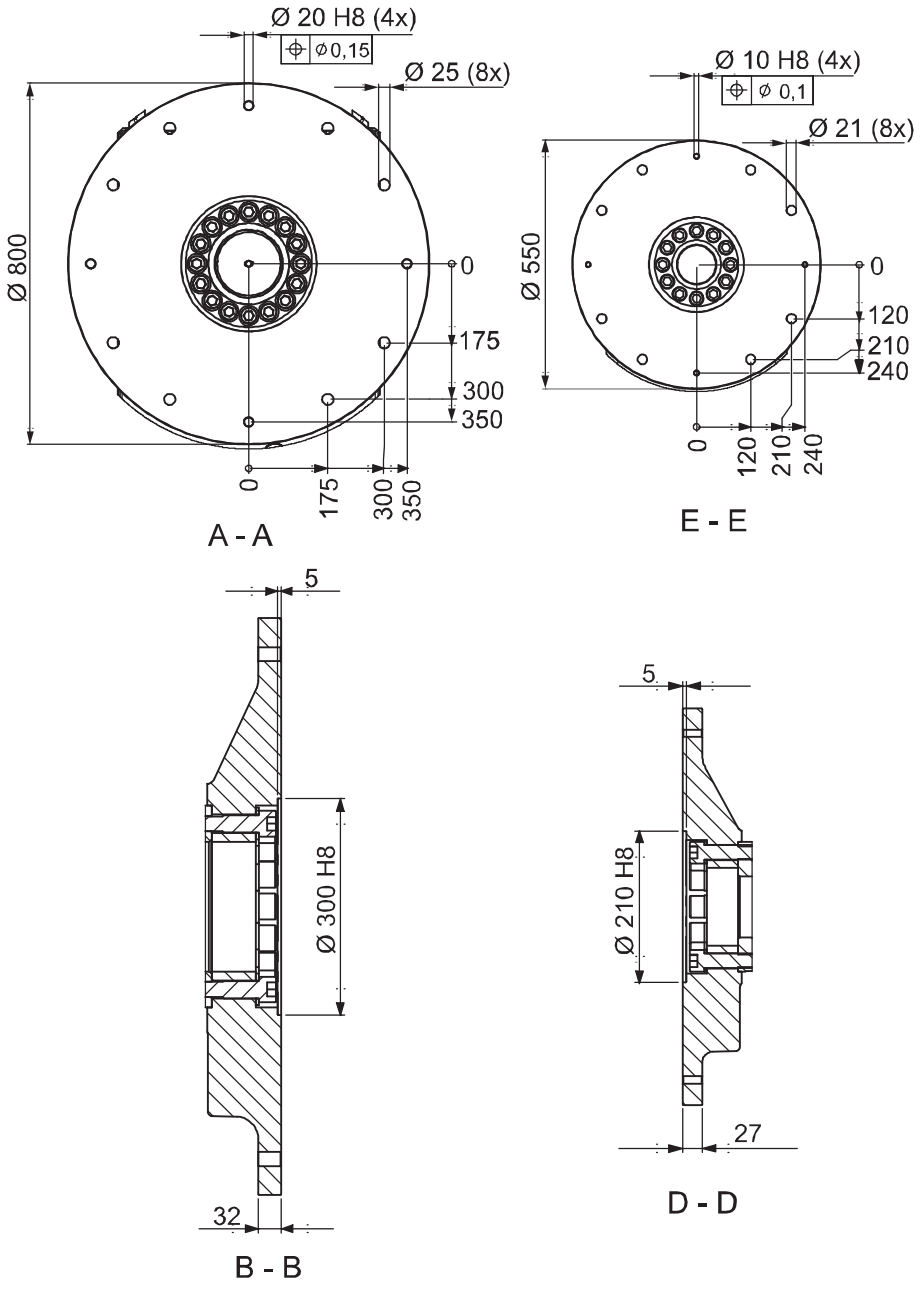
xx1000000742

Pos	Description
A	Length = X
D	Adsjusting bolts (8x)

Continues on next page

2.5.4 Dimensional drawings

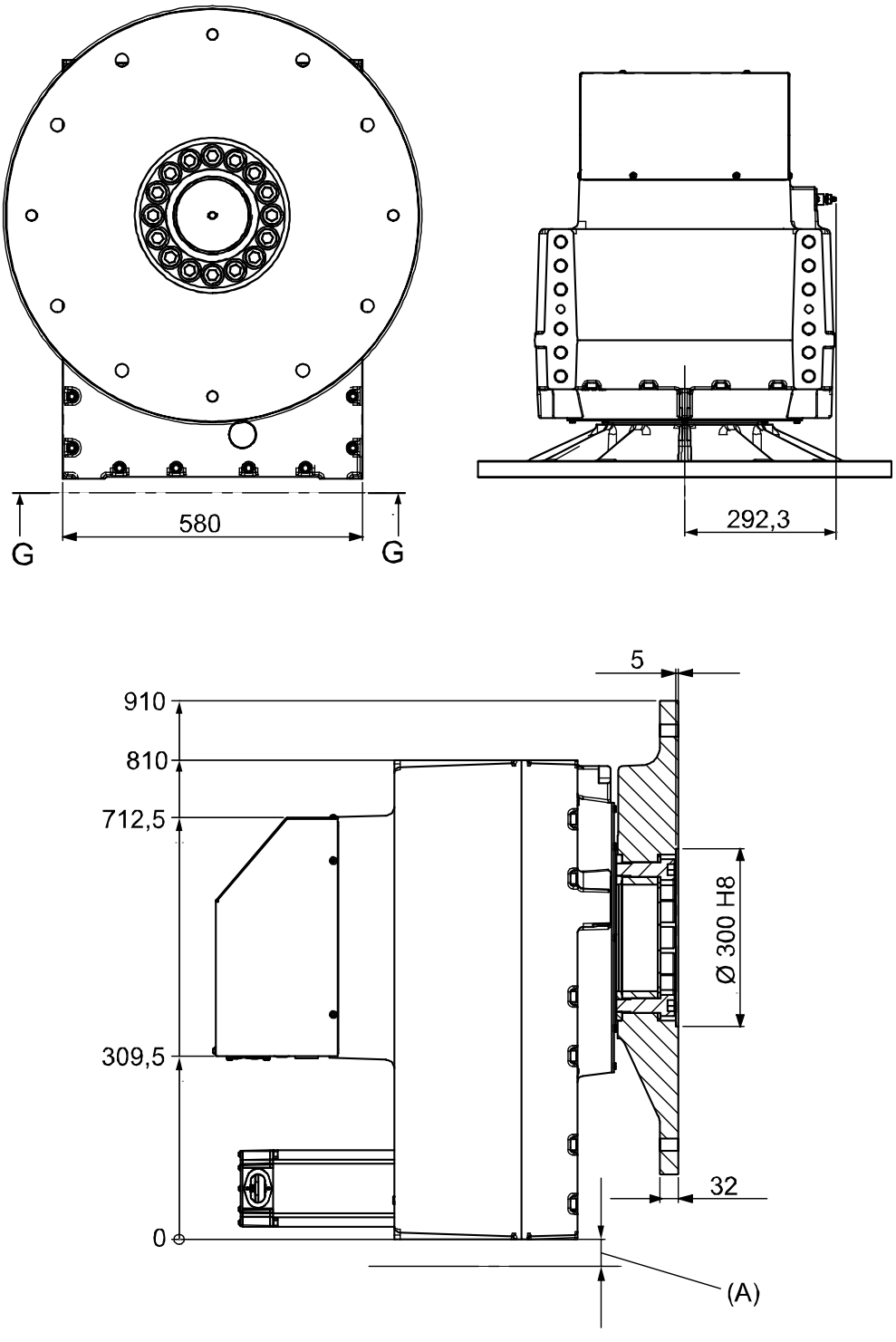
Continued



xx1000000743

Continues on next page

Rotary unit MTD 5000



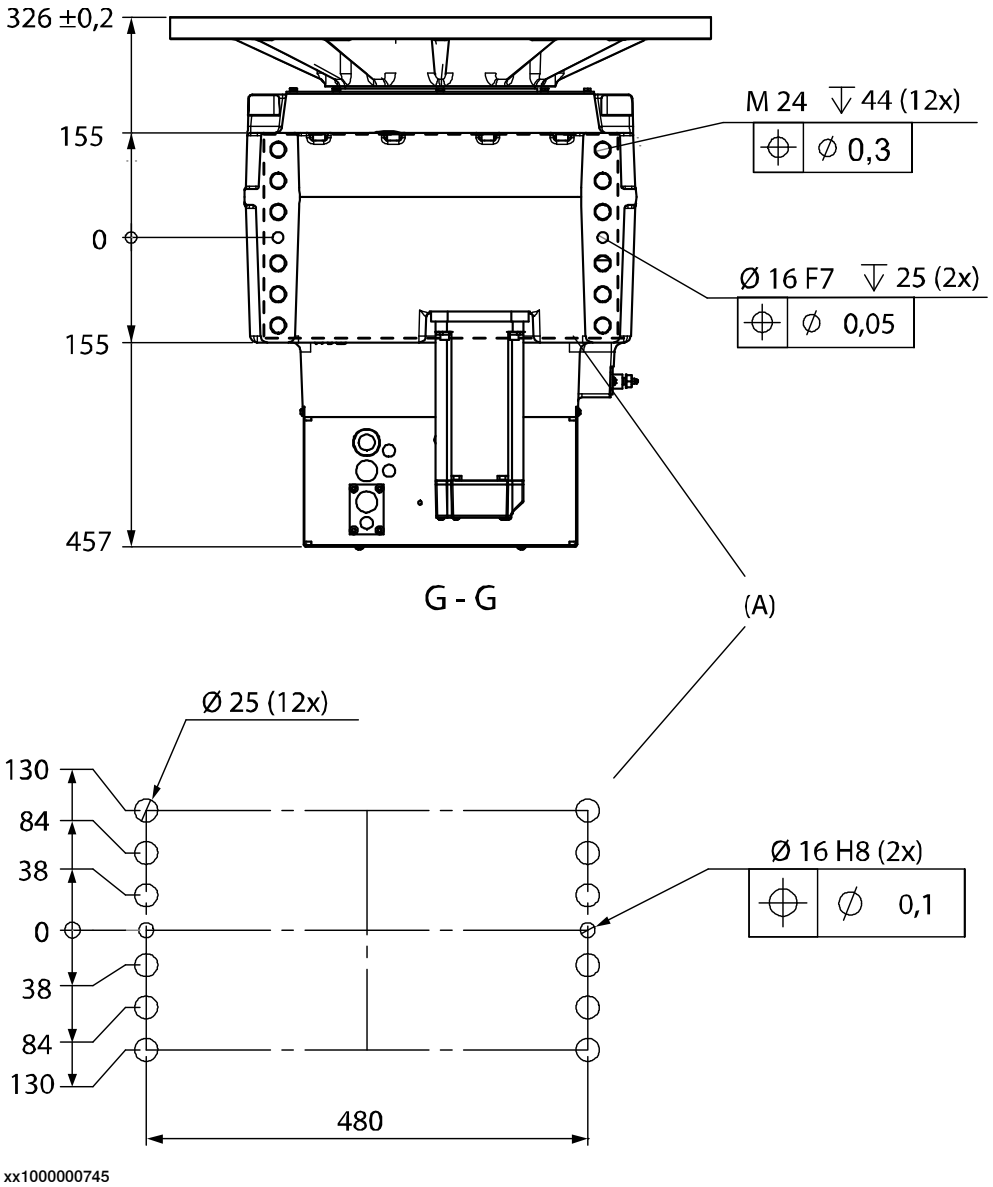
xx1000000744

Pos	Description
A	46 mm Recommended min. clamping length.

Continues on next page

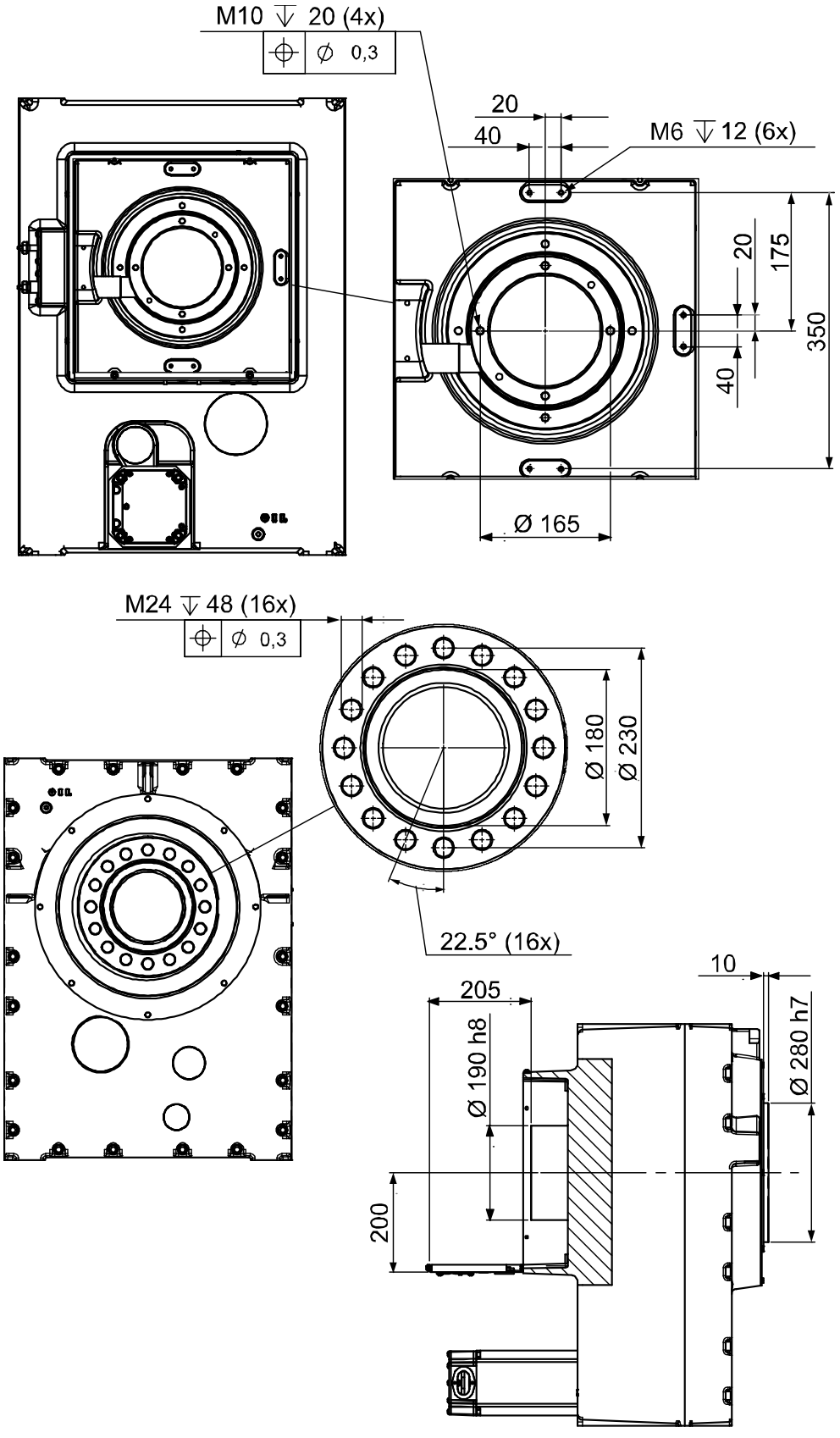
2.5.4 Dimensional drawings

Continued



Pos	Description
A	Hole configuration for mounting base.

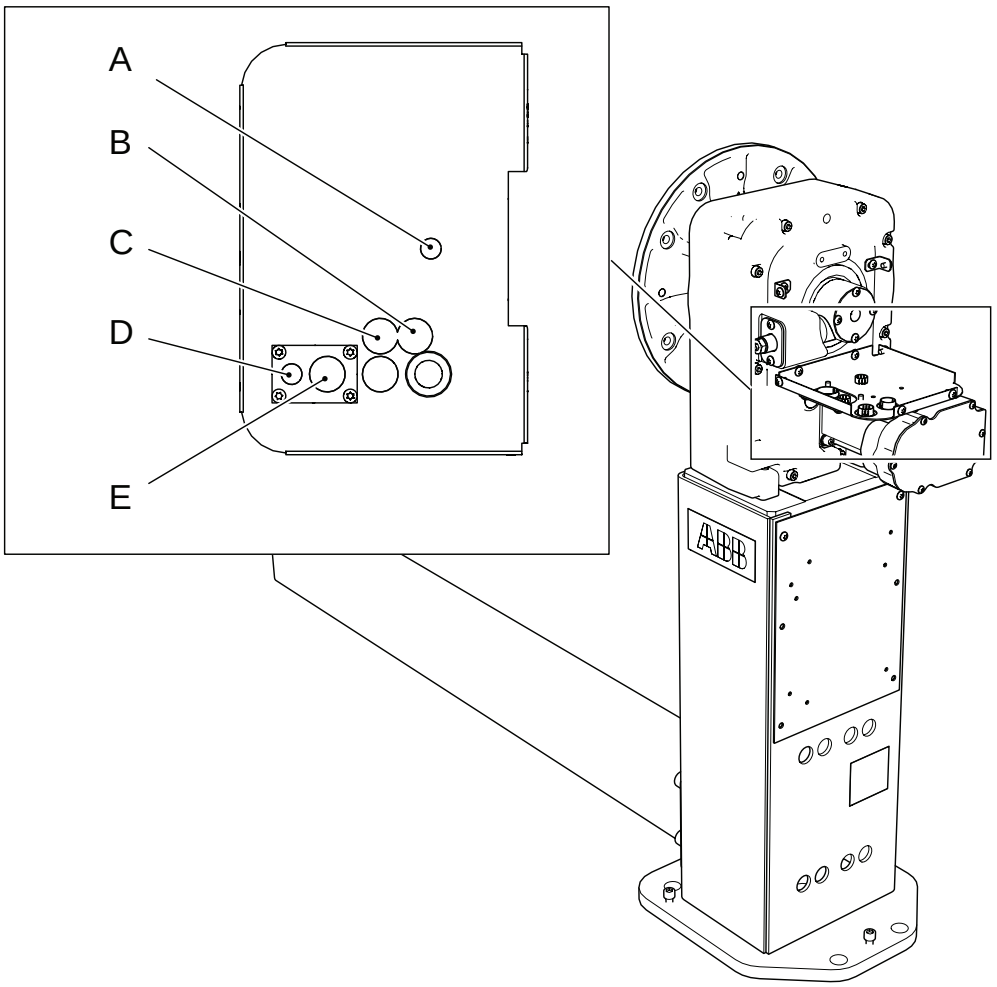
Continues on next page



Continues on next page

2.5.4 Dimensional drawings
Continued

Connections



xx2300001485

Pos	Description	Pos	Description
A	T1 (swivel 1 air)	D	Station 1 (CS1) Station 2 (CS2)
B	T1 (swivel 1 el/1 air)	E	Station 1 (CP1) Station 2 (CP2)
C	T2		

2.6 IRP R-300/ -600/ -1000

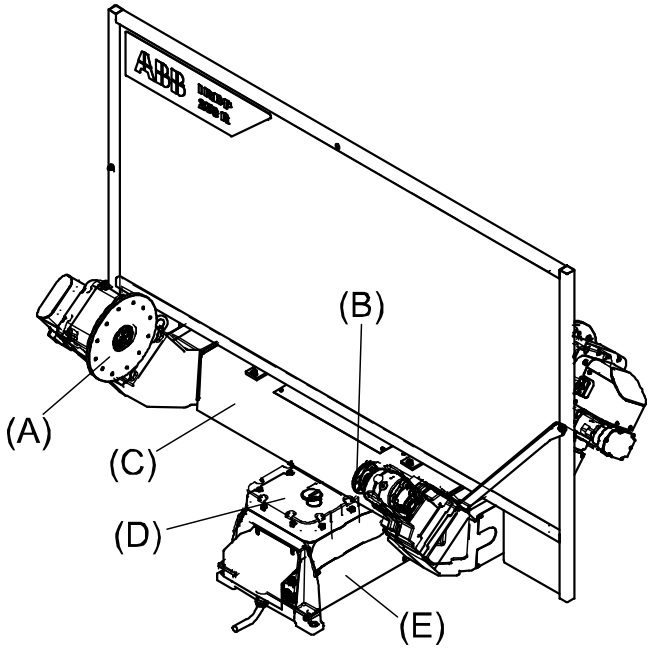
2.6.1 General

Introduction

The positioner is designed to handle workpieces of a weight up to 300/600/1000 kg (including the fixture) in connection with robot processes.

The positioner features a twin station solution where the robot works on one side and the operator loads and unloads on the other. The modular design, few and heavy-duty moving parts as well as minimal maintenance demands make the positioner service friendly.

The positioner is designed with the following main sections (Figure below).



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Pos	Description	Pos	Description
A	Rotary unit, PLATE	D	Station interchange unit, INTERCH
B	Support collar	E	SMB unit
C	Stand		

On the outgoing shaft of the station switching unit there is a frame on which two rotary units are fitted.

On the outgoing shaft of the rotary unit (A, PLATE) a faceplate is fitted. The faceplate has plain holes and guide holes for securing fixtures. On the opposite side there is a support collar used for fixture support.

A screen is fitted between the two stations, which protects the operator from arc-eye.

The rotary unit is fitted with a current collector in the form of a slip ring in order to transfer weld current.

2.6.2 Technical data

General

Note

Max speed specified in the table below only applies to standard products.

Technical Data	IRP R-300	IRP R-600	IRP R-1000
Max handling capacity	300 kg / side	600 kg / side	1000 kg / side
Max load difference between sides 1 and 2 at operation	200 kg	350 kg	350 kg
Max continuous torque	350 Nm	650 Nm	900 Nm
Center of gravity	See load diagram	See load diagram	See load diagram
Max bending moment	650 Nm	3300 Nm	5000 Nm
Positioning time 90 degrees	0.8 -1.2 s	1.0 -1.3 s	1.0 -1.3 s
Positioning time 180 degrees	1.4 -1.9 s	1.5 -2.1 s	1.5 -2.1 s
Positioning time 360 degrees	2.3 -2.7 s	2.7 -3.4 s	2.7 -3.4 s
Repetition accuracy with equal loads and radius 500 mm	±0.05 mm	±0.05 mm	±0.05 mm
Max. rotation speed	180 deg/s	150 deg/s	150 deg/s
Index time	3.4 - 3.8 s	3.5 - 3.7 s	3.5 - 3.7 s
Weld to weld time	5.2 - 5.6 s	5.8 - 6.0 s	5.8 - 6.0 s
Max welding current, 60% duty cycle	600 Amp	600 Amp	600 Amp
Weight	620 -645 kg	1285 - 1380 kg	1285 - 1380 kg

2.6.3 Loading diagram

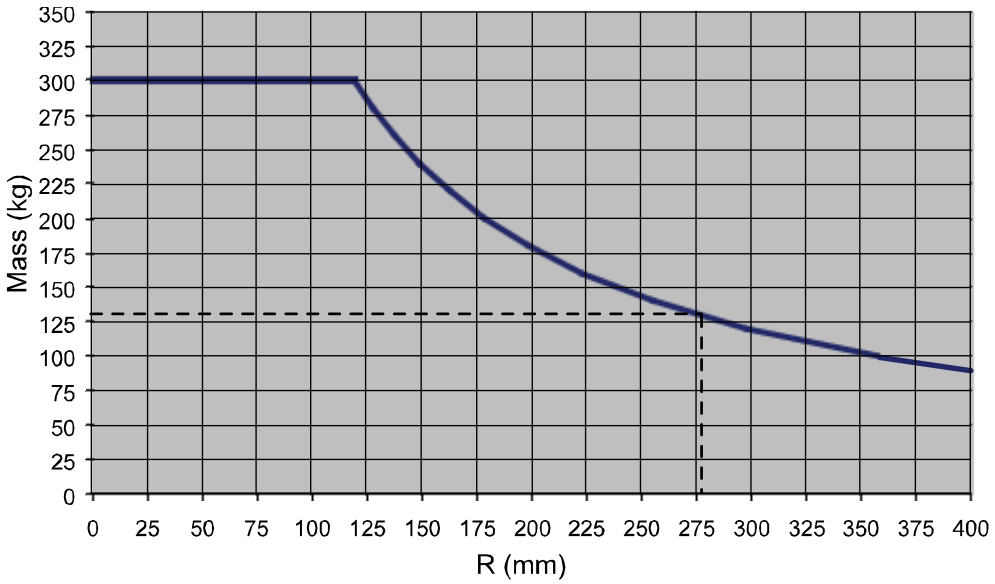
General

The diagrams (Figures below) show the maximum permitted center of gravity displacement from the center of rotation at different loads.

The load refers to the workpiece including the fixture. Also refer to the value for the max. continuous torque.

IRP R-300

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 129 kg.



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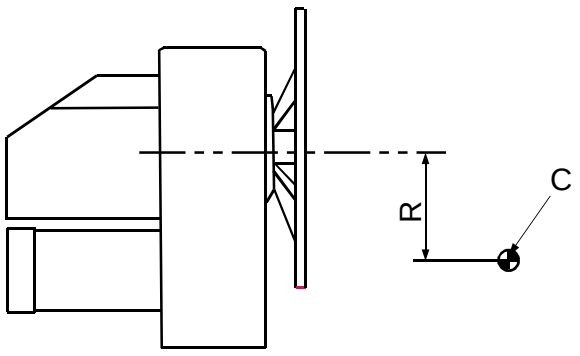

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Pos	Description
R	R = Distance in mm
C	Center of gravity

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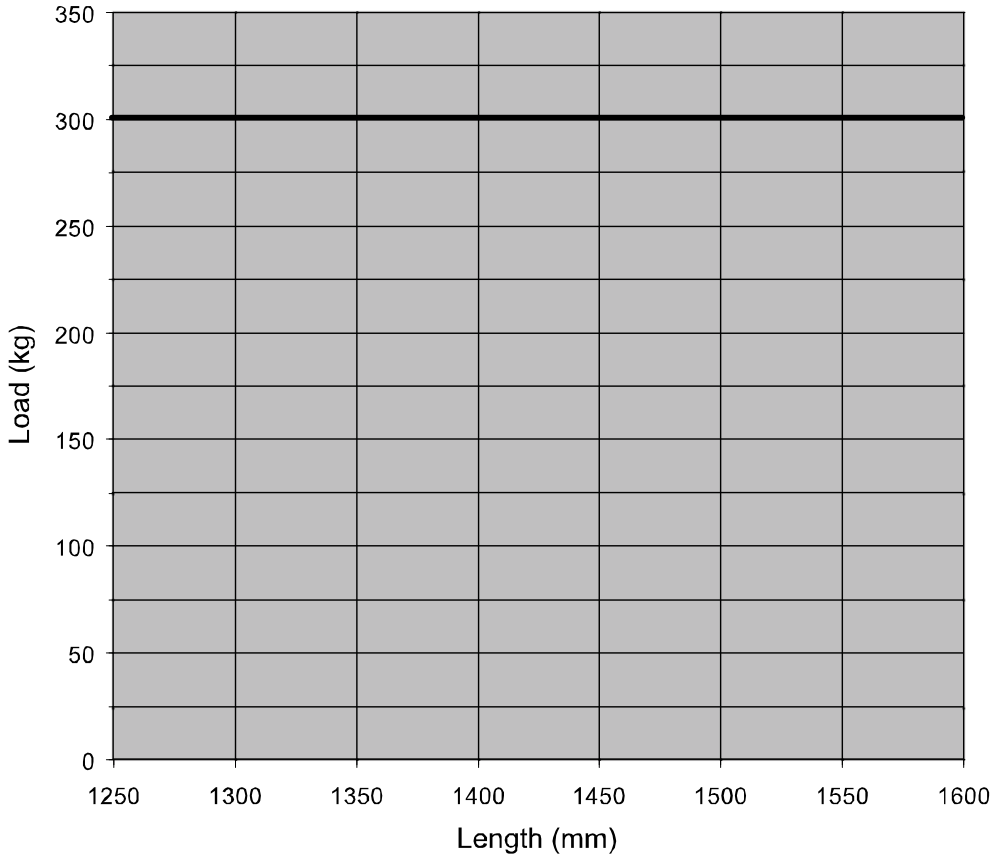
2.6.3 Loading diagram
Continued

Max load at different length between rotary unit and support collar is shown below.



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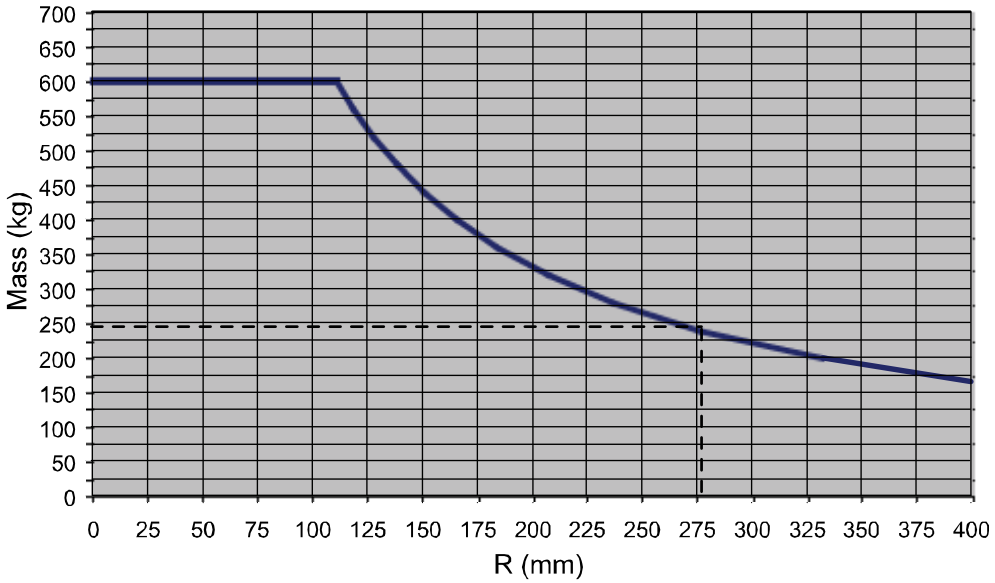
IRP R-600

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 240 kg.



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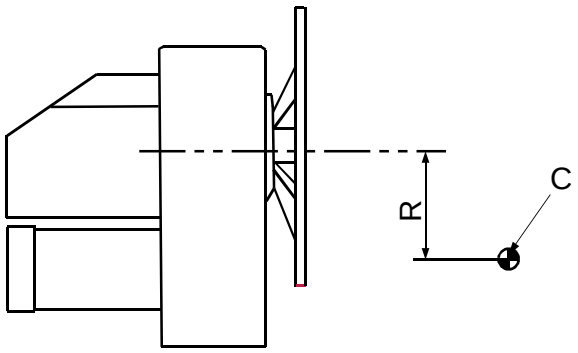

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Pos	Description
R	R = Distance in mm
C	Center of gravity

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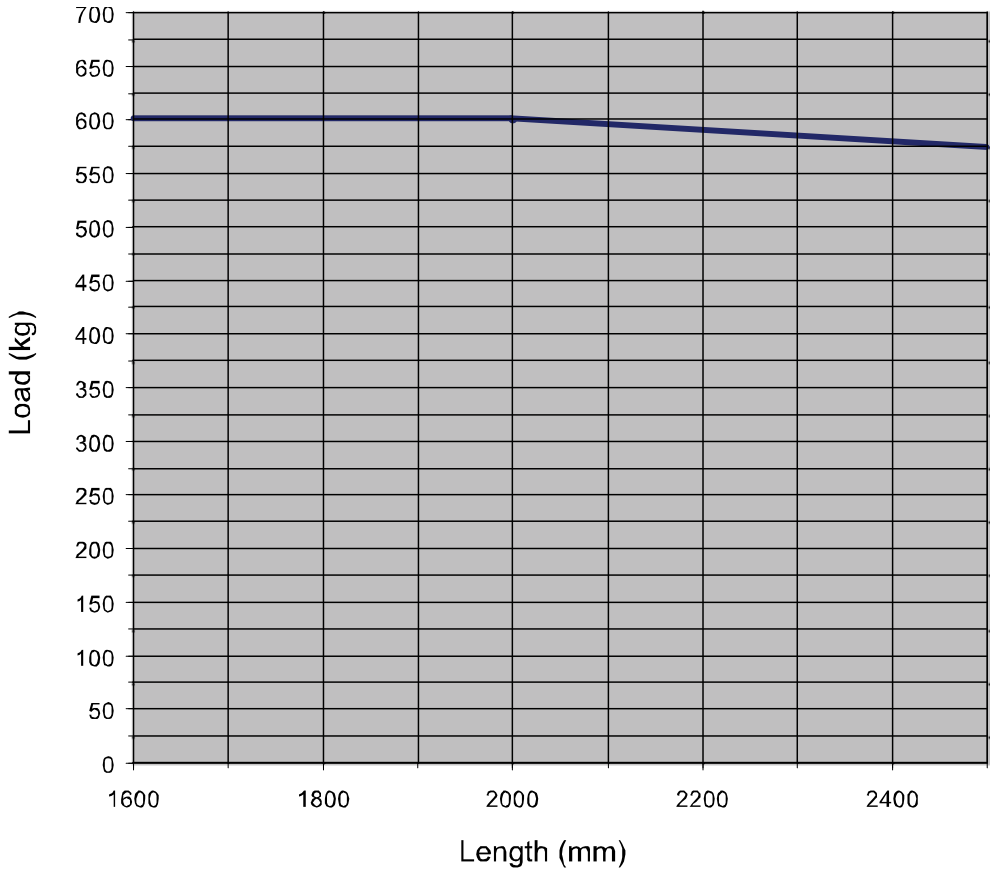
2.6.3 Loading diagram
Continued

Max load at different length between rotary unit and support collar is shown below.



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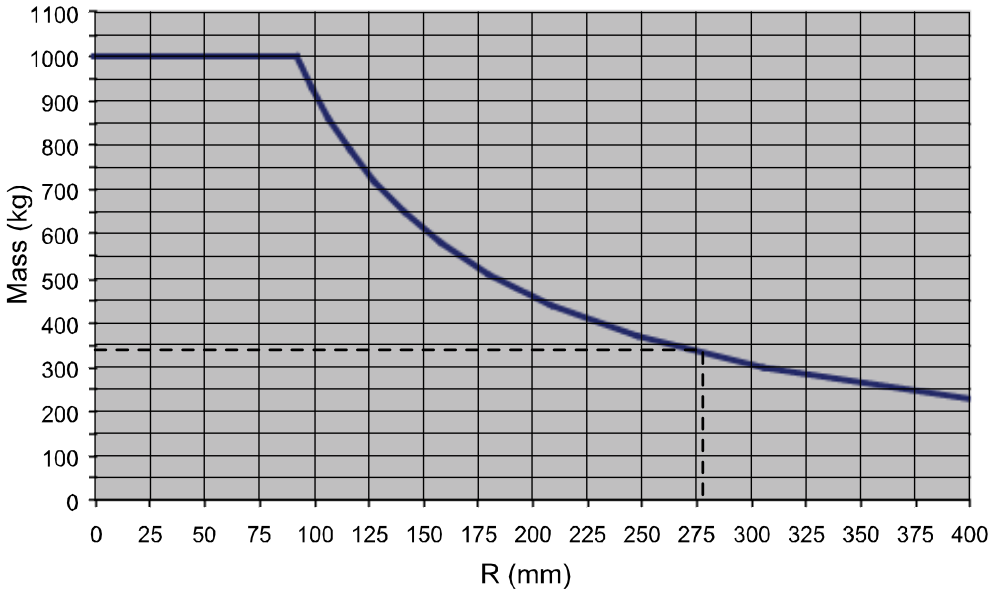
IRP R-1000

If the center of gravity is placed 276 mm from the center of rotation the load may not be greater than: 333 kg.



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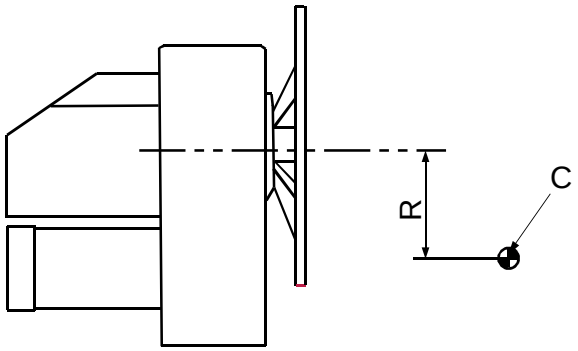

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Pos	Description
R	R = Distance in mm
C	Center of gravity

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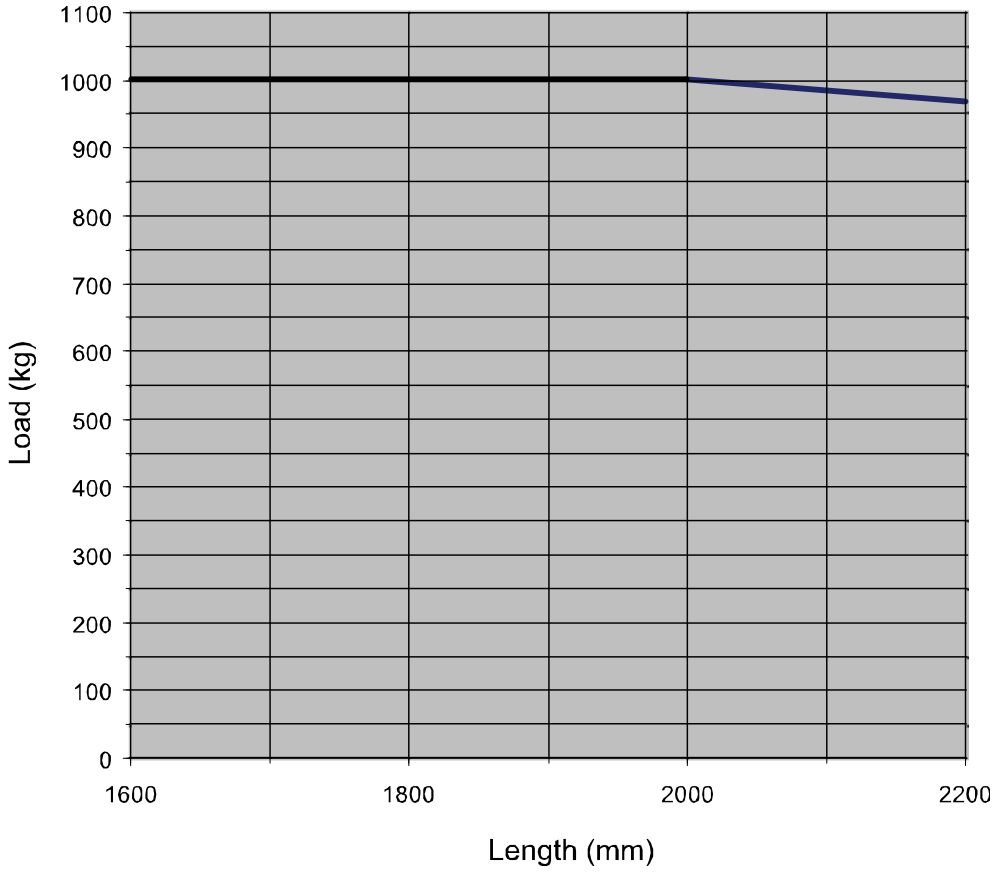
2.6.3 Loading diagram
Continued

Max load at different length between rotary unit and support collar is shown below.



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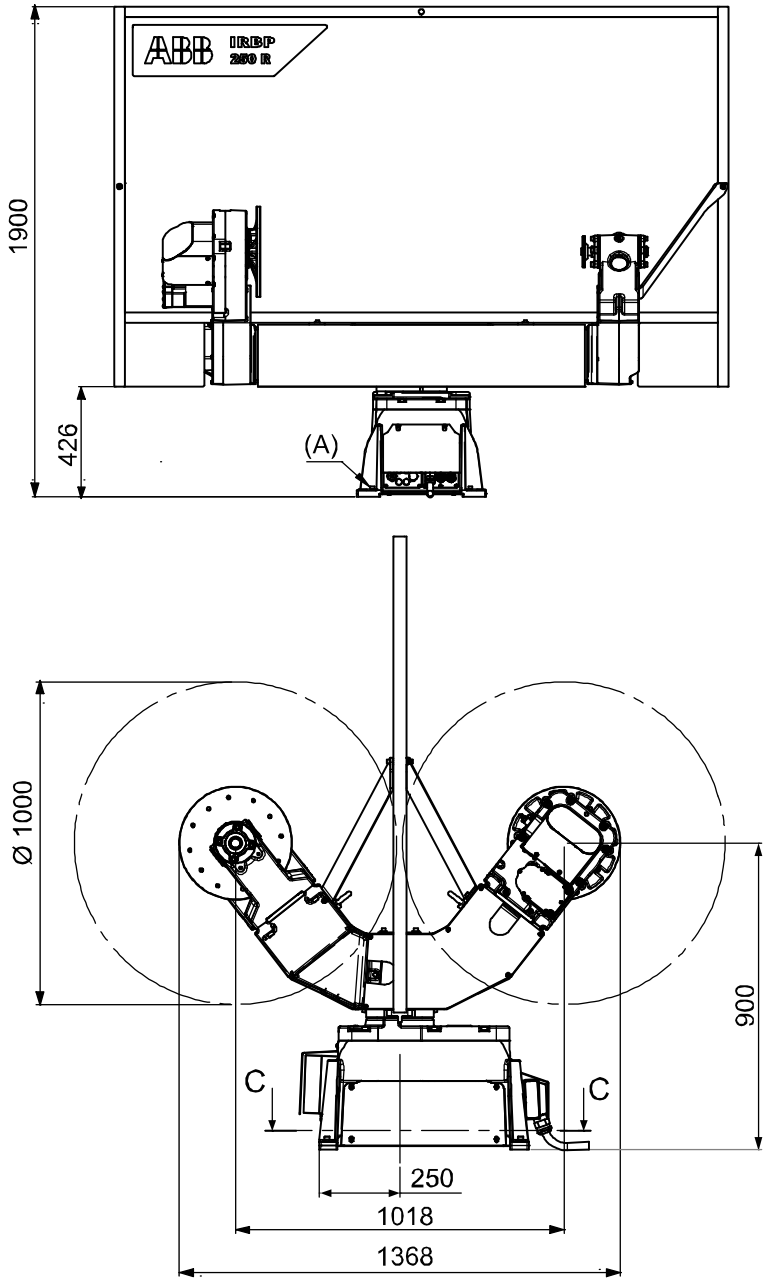
2.6.4 Dimensional drawings

IRP R-300



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Pos	Description
A	Adjusting bolts (4x)

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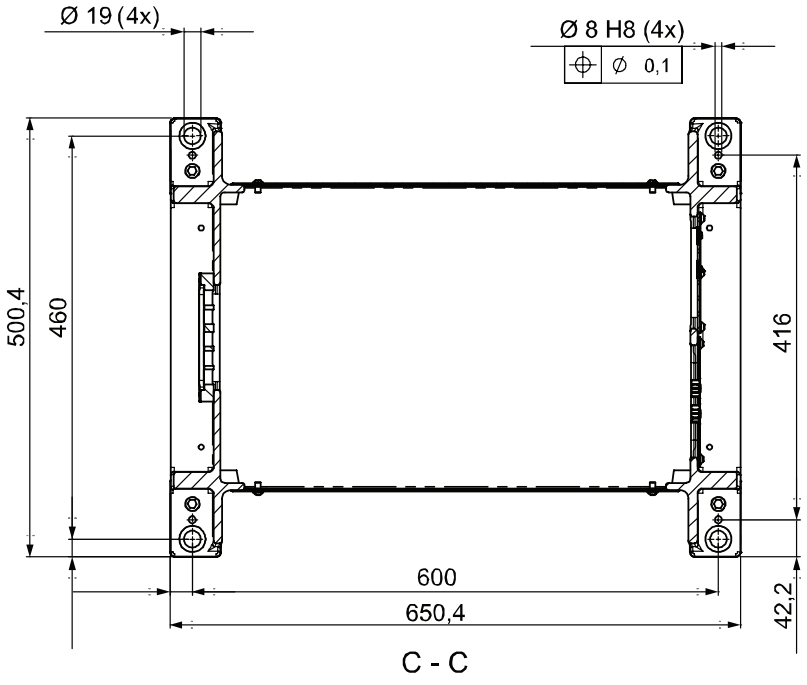
2.6.4 Dimensional drawings

Continued



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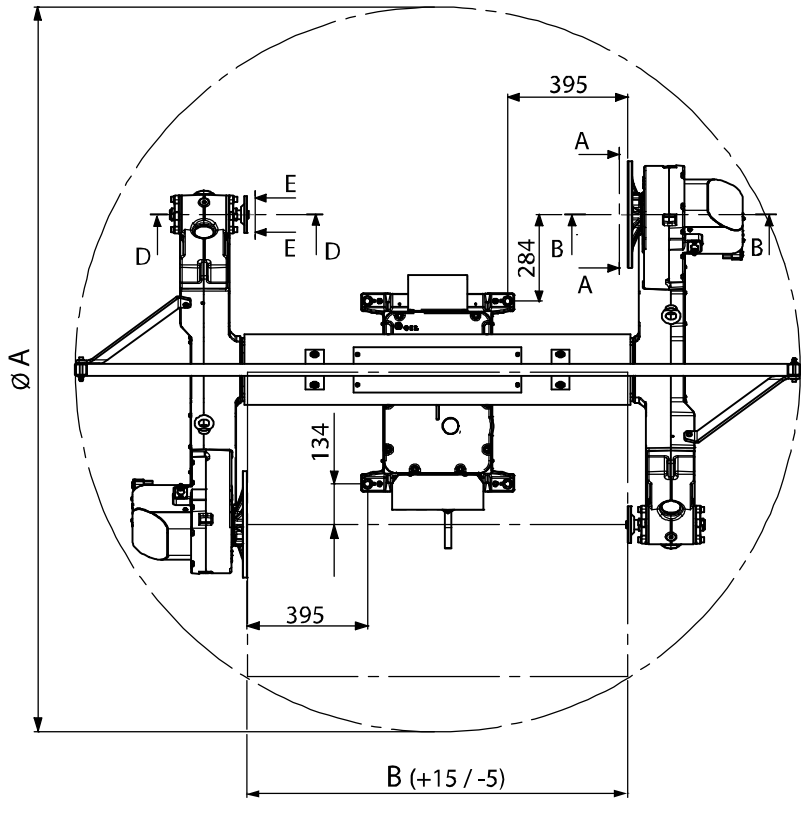

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Pos	Description
A - B	2380 - 1250 mm or 2680 - 1600 mm

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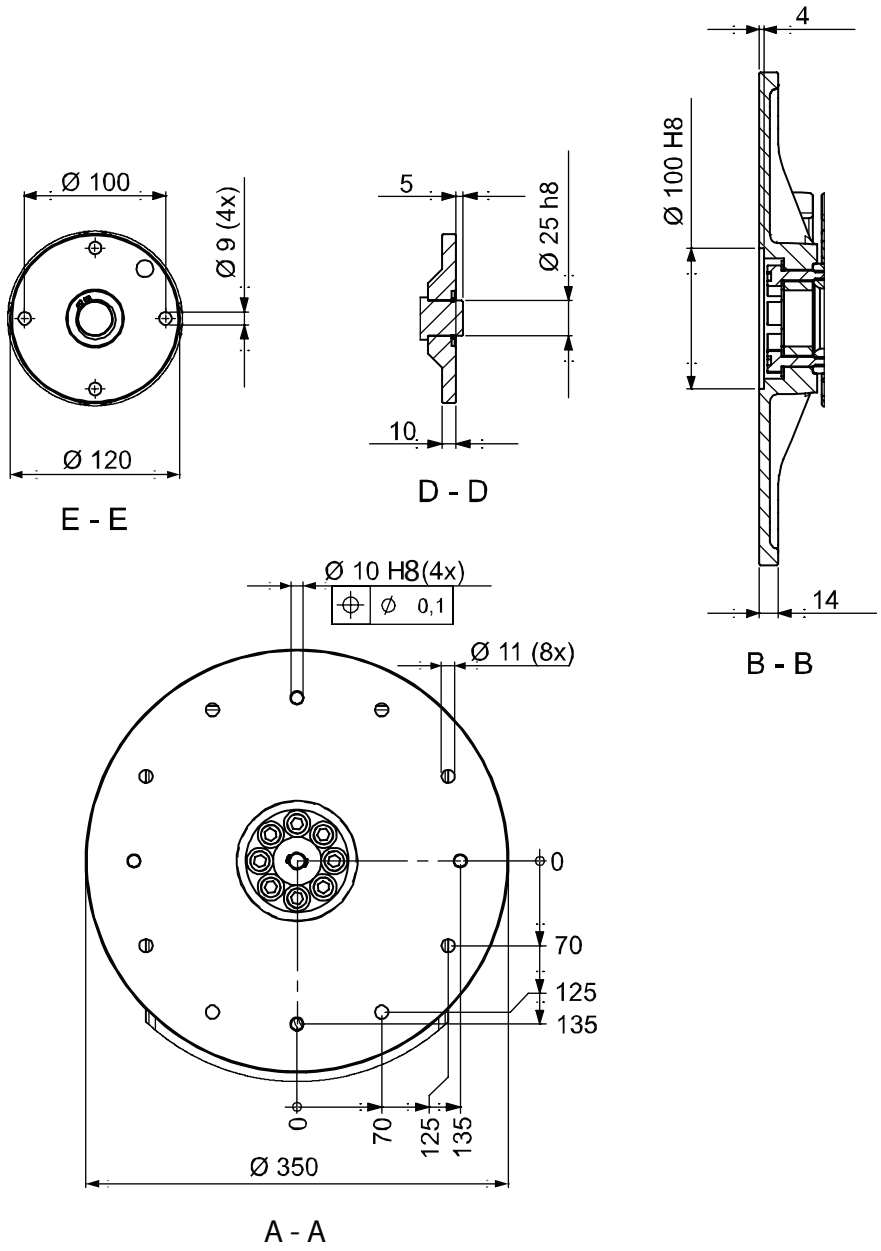

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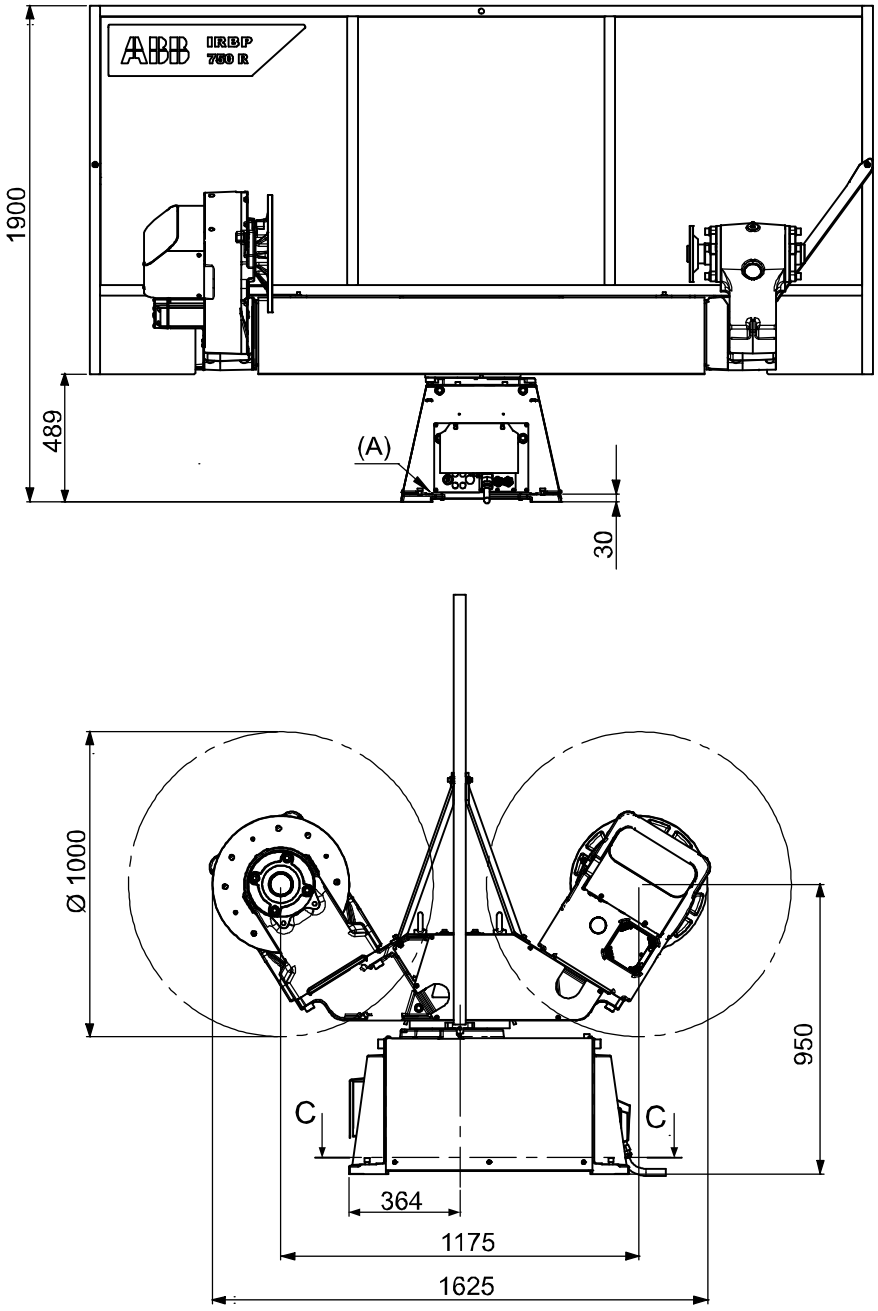
2.6.4 Dimensional drawings
Continued

IRP R-600 / -1000 Ø 1000



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Pos	Description
A	Adjusting bolts (4x)

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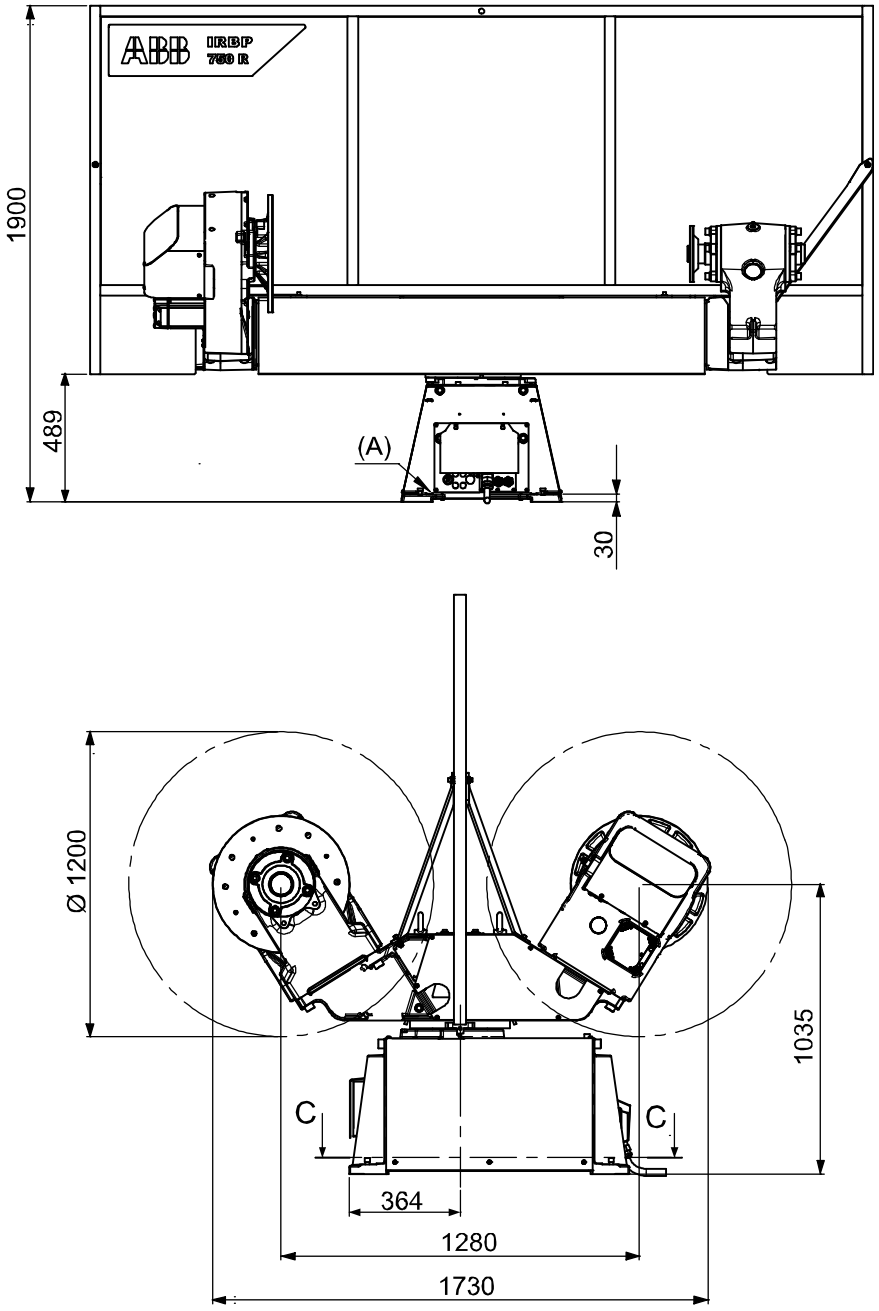
IRP R-600 / -1000 Ø 1200



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Pos	Description
A	Adjusting bolts (4x)

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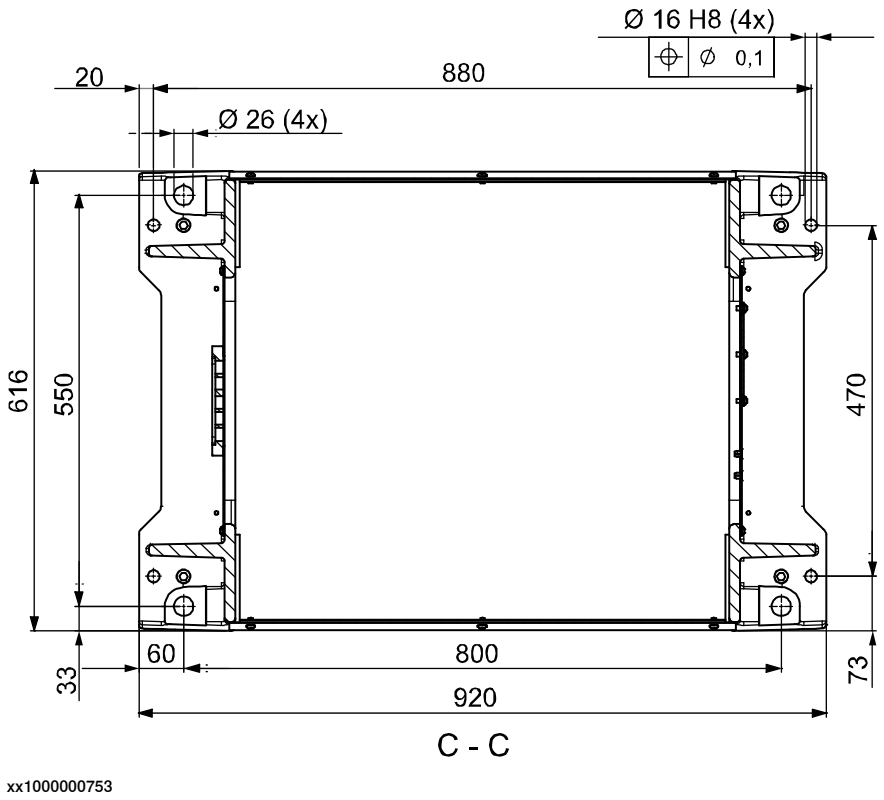
2.6.4 Dimensional drawings
Continued

IRP R-600 / -1000



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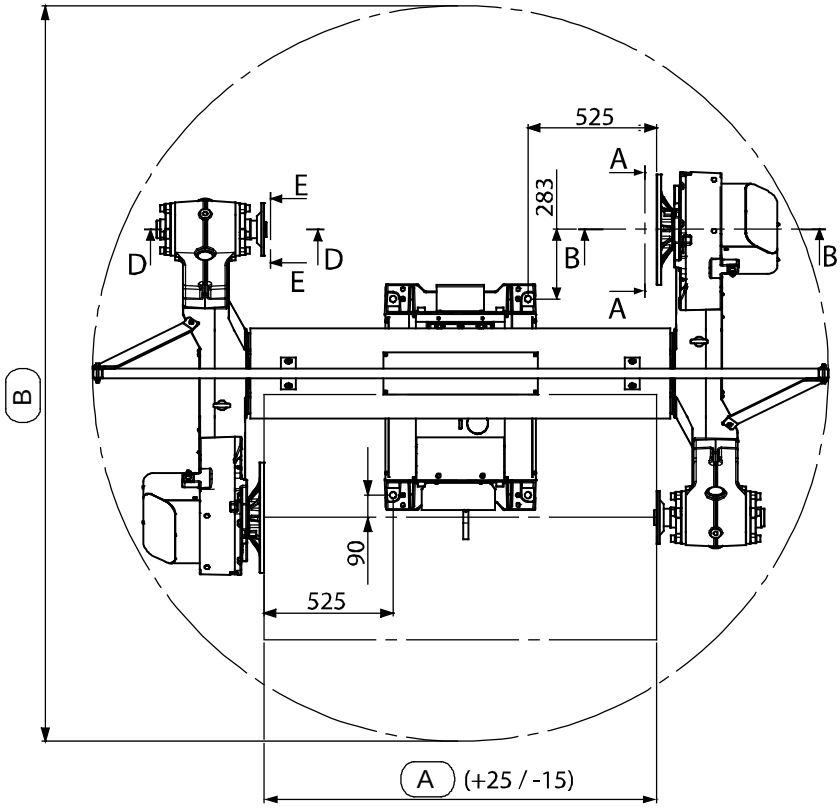

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IRP R-600 / -1000 Ø 1000		IRP R-600 / -1000 Ø 1200	
A (mm)	**B (mm)**	**A (mm)**	**B (mm)**
1600	3000	1600	3000
2000	3350	2000	3350

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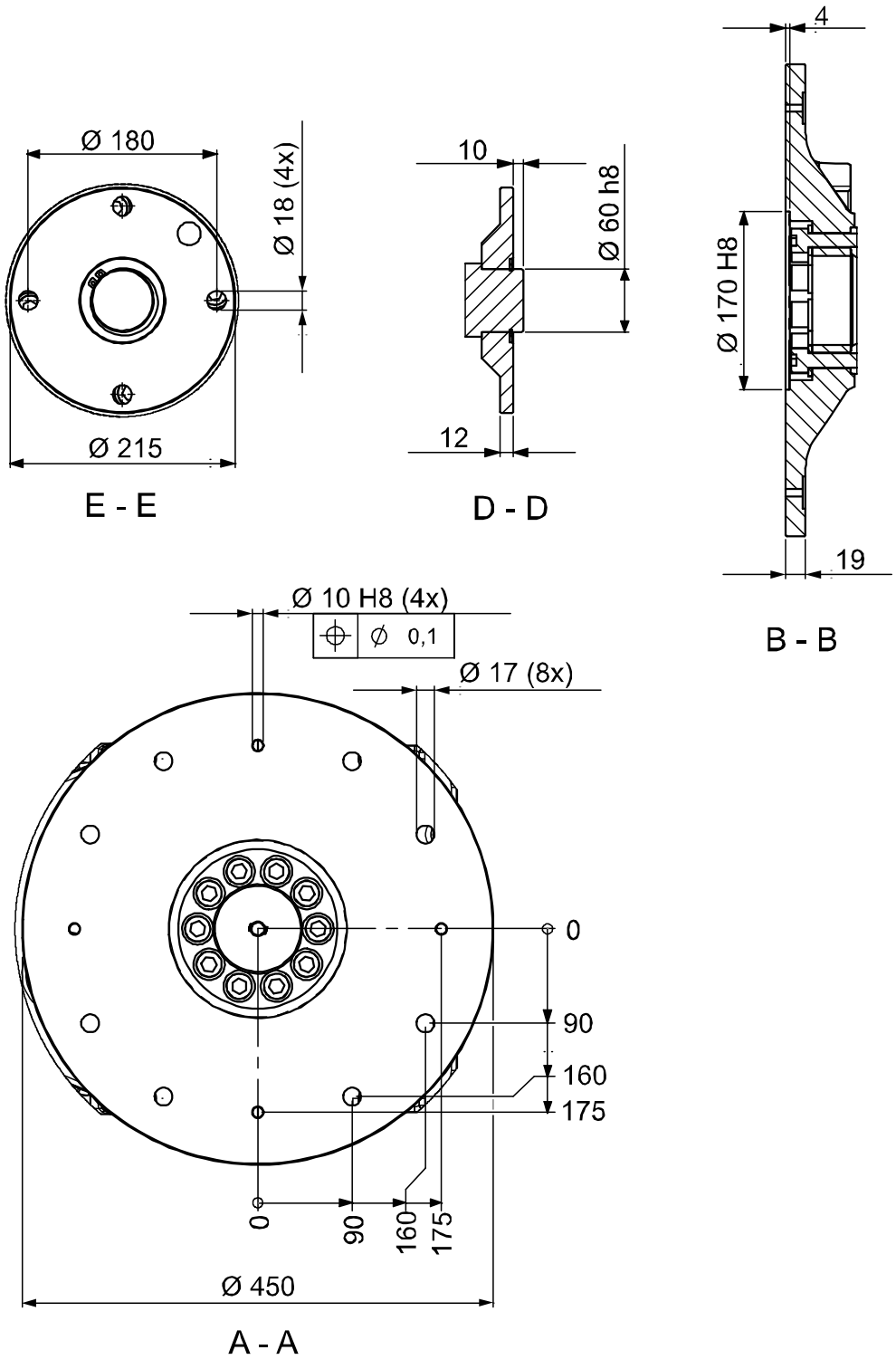
2.6.4 Dimensional drawings

Continued



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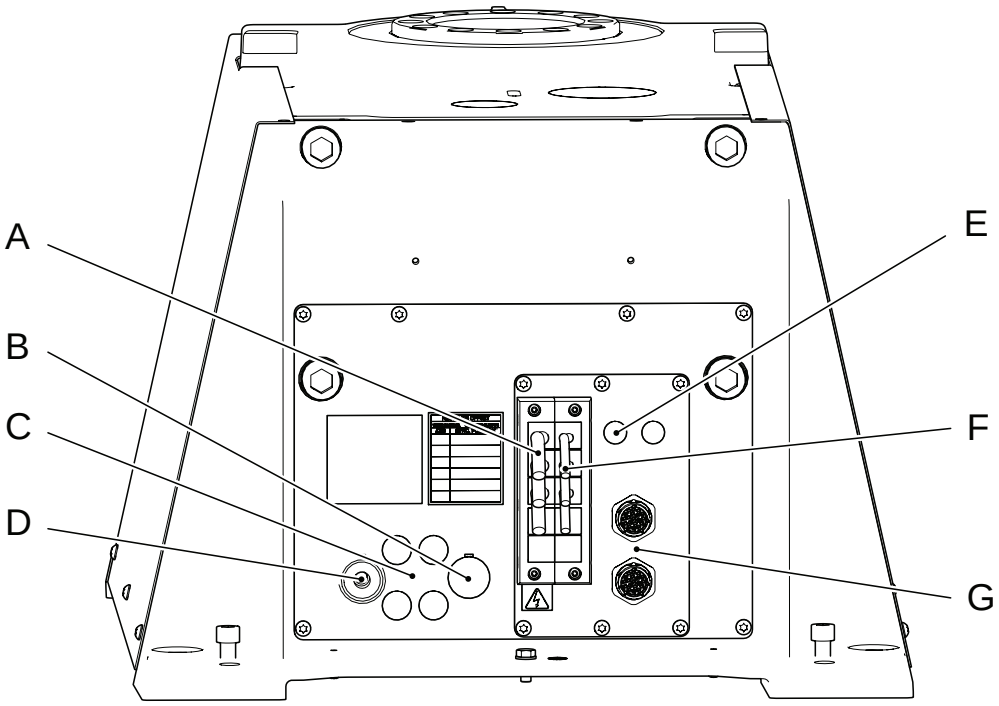
Connections



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Pos	Description	Pos	Description
A	Power axis 1 (IRP C) Power axis 1-3 (IRP R)	E	Profibus (option)
B	Extra weld return cable (option)	F	Resolver signal, axis 1 (IRP C) Resolver signal, axis 1-3 (IRP R)
C	Air (option)	G	Customer power (option)
D	Weld return cable		

2.7 Integration of fixtures

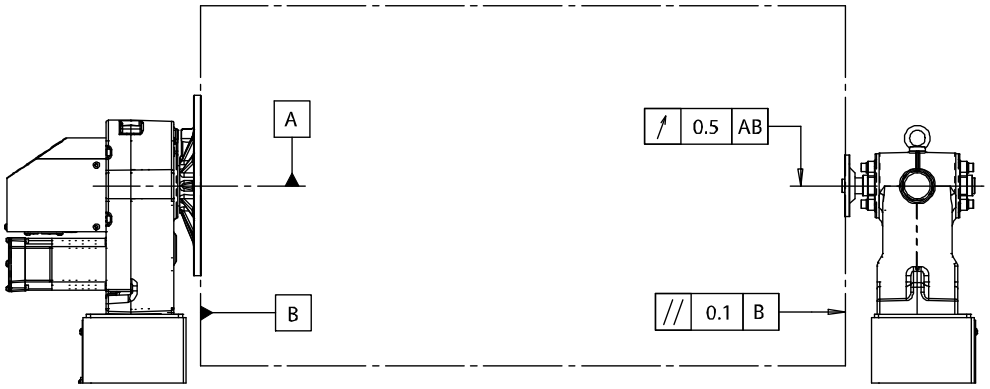
2.7.1 IRP K-300/-600/-1000, L-300/-600/-1000/-2000, R-300/-600/-1000

General

The position of the center of gravity is to be calculated when designing fixtures. After this check that the center of gravity is within the permitted range (see the chapter Loading diagram).

See the dimensional drawings for the positioner, faceplate and support collar for the fasteners' installation measurements. The strength grade for the bolts in the fixture should be 12.9 or the equivalent.

The fixture must conform to specific tolerances to maintain trueness and parallelism in order to prevent clamping forces from occurring. See Figure below.



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2.7.2 IRP A-250/-500/-750, B-250/-500/-750, C-500/-1000

General

See the dimensional drawings for the positioner for the fasteners' installation measurements.

The strength grade for the bolts in the fixture should be 12.9 or the equivalent.

2.8 Swivels

2.8.1 Introduction

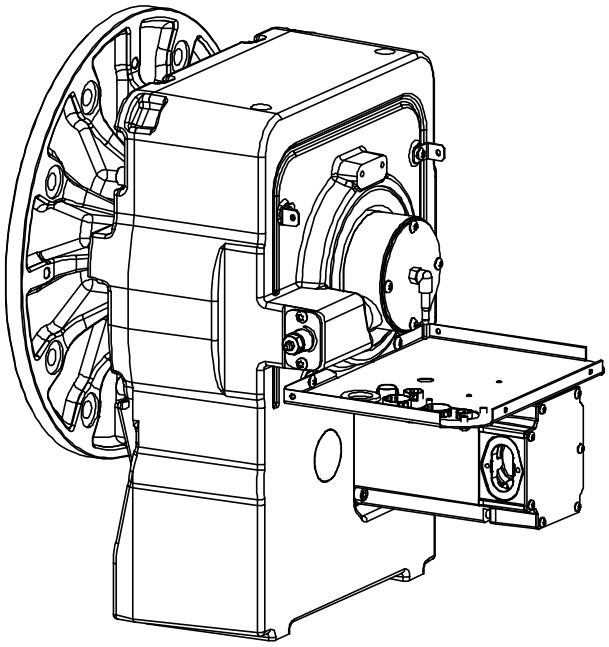
General

The swivels can be combined in different configurations for different requirements.

- Air swivel for 1 or 2 channels
- Electrical swivel for 10 signals.
- Air/electrical swivel for 10 signals and 1 air channel.

2.8.2 Air swivel for 1 channel

General



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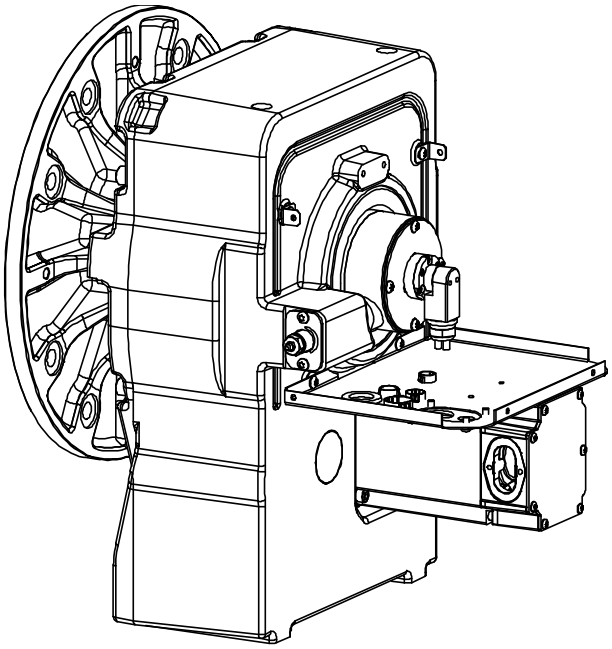
Technical specificationfor 1-channel swivel

Channels	1
Dimensions	1 /4“
Media	Air, max 10 bar
Max. temperature media	60 °C

2.8.3 Electrical swivel

General



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The function is to transfer electrical signals between a fixed part and a moving part.

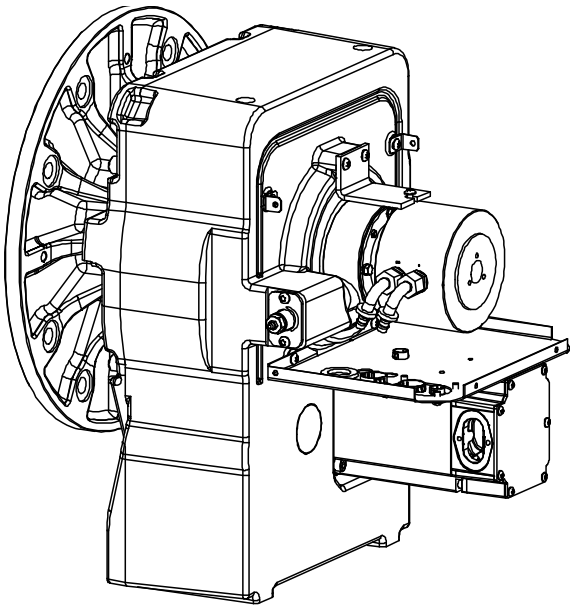
The electrical swivel can transfer different types of signals, for example 24 V DC and data bus systems. Technical specification, see table below.

Technical specification for the electrical swivel

Power	
Channels	10
Current	Max 3 A /channel
Voltage	Max 24 V DC
Conductor cross-section	0.15 mm² AWG 22
Data bus	
Profibus DP	Max 12 MBit/s
Conductor cross-section	0.64 mm²

2.8.4 Air/water swivel for 2 channels

General



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The function is to transfer air/water between a fixed part and a moving part.
Technical specification, see table below.

Technical specification for 1/2 channels air/water swivel for IRP 250-series

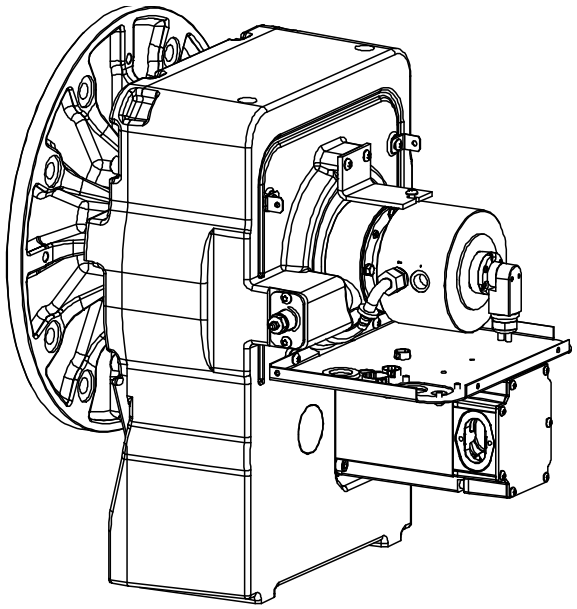
Channels	1 or 2
Dimensions	1 / 4"
Media 1	Air, max 10 bar

Technical specification for 1/2 channels air/water swivel for IRP 500/750/2000/5000

Channels	1 or 2
Dimensions	1 / 2"
Media 1	Air, max 10 bar

2.8.5 Air swivel for 1 channel and electrical swivel

General



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The function is to transfer air and electrical signals between a fixed part and a moving part. Technical specification, see table below.

Technical specification for 1 channel air swivel for IRP 250-series

Channels	1
Dimensions	1 / 4"
Media 1	Air, max 10 bar

Technical specification for 1 channel air swivel for IRP 500/750/2000/5000

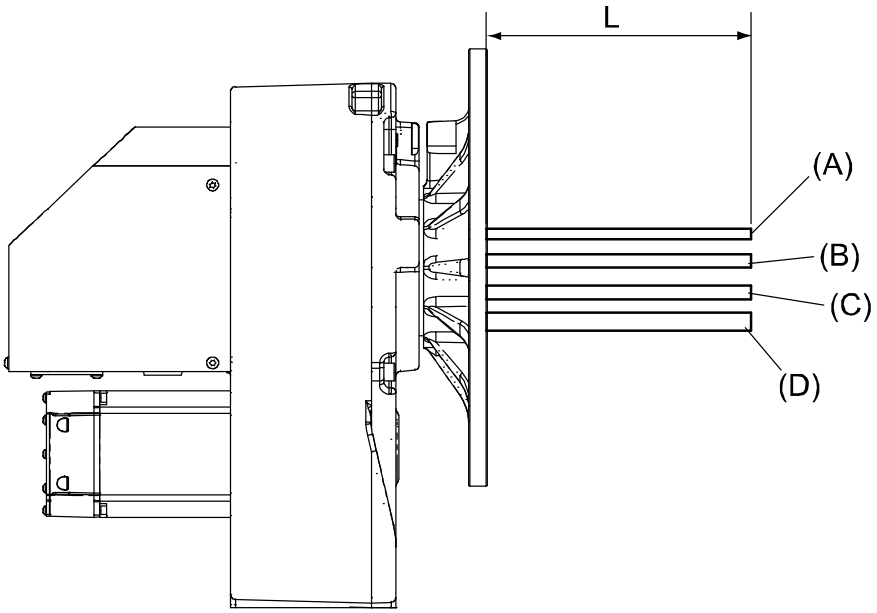
Channels	1
Dimensions	1 / 2"
Media 1	Air, max 10 bar

Technical specification for the electrical swivel

Power	
Channels	10
Current	Max 3 A /channel
Voltage	Max 24 V DC
Conductor cross-section	0.15 mm² AWG 22
Data bus	
Profibus DP	Max 12 MBit/s
Conductor cross-section	0.64 mm²

2.8.6 Swivel connections

General



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Pos	Description	Pos	Description
L	Free length= 500 mm	C	Air hose 1, diam. (Ø XX mm) see table below.
A	Profibus cable, diam 6 mm	D	Air hose 2, diam. (Ø XX mm) see table below.
B	Power cable, diam. 8 mm		

IRP type	1 ch. air	2 ch. air	1 ch. air + 10 el.	IRP type	1 ch. air	2 ch. air	1 ch. air + 10 el.
IRP A-250	13	13	13	IRP K-300	13	13	13
IRP A-500	13	16	16	IRP K-600	13	16	16
IRP A-750	13	16	16	IRP K-1000	13	16	16
IRP B-250	13	13	13	IRP L-300	13	13	13
IRP B-500	13	16	16	IRP L-600	13	16	16
IRP B-750	13	16	16	IRP L-1000	13	16	16
IRP C-500	13	16	16	IRP L-2000	13	16	16
IRP C-1000	13	16	16	IRP L-5000	13	16	16
IRP D-300	13	13	13	IRP R-300	13	13	13
IRP D-600	13	16	16	IRP R-600	13	16	16
				IRP R-1000	13	16	16

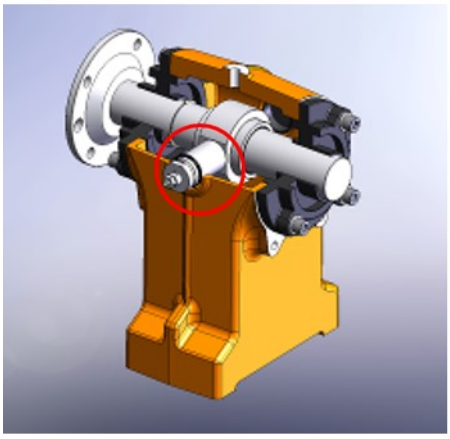
2.8.7 Extra current collector for positioner types K / L / R

General

An extra current collector can be fitted to increase max weld currents and/or aviod problems with the magnetic blow mechanism when welding.

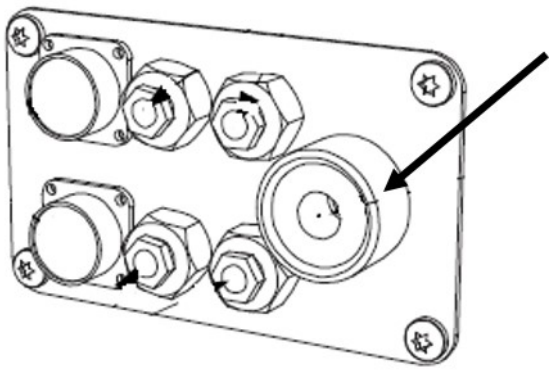
Collector for types L

L-positioners have the second weld return outlet on the tailstock.



Collector for types R and K

R and K positioners have the second weld return outlet on the station interchange unit.



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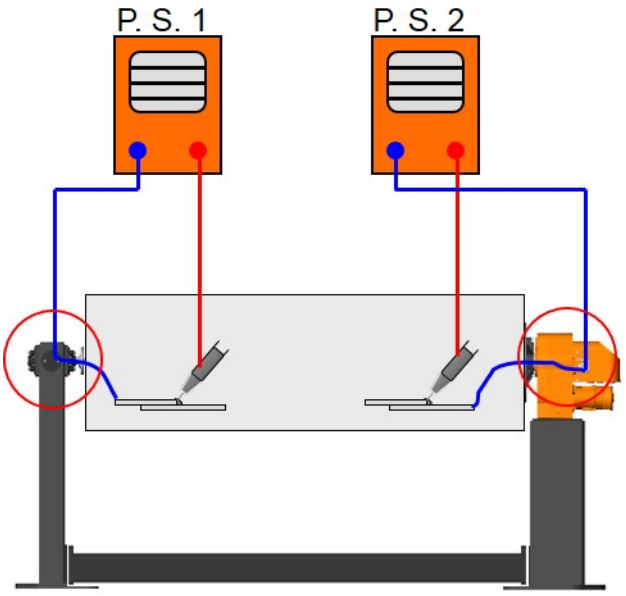
Principle of extra current collector

Two welding equipment connected to a positioner with a second current collector.



Note

Current from one weld circuit is transferred through the current collector in the gearbox.

Two seperated weld circuits gives less risk for interference.

2.9 Load diagrams

2.9.1 Introduction

WARNING

It is very important to always define correct actual load data and correct payload of the positioner. Incorrect definitions of load data can result in overloading of the positioner.

If incorrect load data is used, and/or if loads outside the load diagram are used, the following parts can be damaged due to overload:

- motors
- gearboxes
- mechanical structure

WARNING

In RobotWare, the service routine LoadIdentify can be used to determine correct load parameters. The routine automatically defines the tool and the load.

See *Operating manual - OmniCore*, for detailed information.

WARNING

Positioners running with incorrect load data and/or with loads outside the load diagram, will not be covered by robot warranty.

2.10 Operating requirements

Protection standards

Positioner type	Protection
IRP A/B/C/K/R	IP42
IRP L	IP65

Explosive environments

The positioner must not be located or operated in an explosive environment.

Ambient temperature

Description	Standard/Option	Temperature
Positioner during operation	Standard	+ 5°C [a] (41°F) to + 50°C (122°F)
For short periods (not exceeding 24 hours)	Standard	up to + 70°C (158°F)

a) At low environmental temperature < 10° C is, as with any other machine, a warm-up phase recommended to be run with the robot. Otherwise there is a risk that the robot stops or run with lower performance due to temperature dependent oil- and grease viscosity.

Relative humidity

Description	Relative humidity
Complete unit during transportation and storage	Max. 95% at constant temperature
Complete unit during operation	Max. 95% at constant temperature

Forces

When a floor mounting base (FMB) is used, then the floor load is the combined load from both the positioner and the robot. The forces are the sum of the maximum component for each direction.

Maximum floor loads in relation to the base coordinate system and indicated per each screw of the base on the positioner, see figure below.

Positioner type	Endurance load in operation (kN)		Max. load at emergency stop (kN)		Screw dim. (qty)
	Fxy	Fz (±)	Fxy	Fz (±)	
IRP A-250	0.8	6.3	1.93	11.5	M16 (4)
IRP A-500	3.3	12.9	6.7	23.2	M20 (4)
IRP A-750	4.4	17.2	9	31	M20 (4)
IRP B-250	2	8.3	3.6	12.4	M16 (4)
IRP B-500	5	20.6	9	30.9	M20 (4)
IRP B-750	5	20.6	9	30.9	M20 (4)
IRP C-500	1.5	6	3	8	M16 (4)

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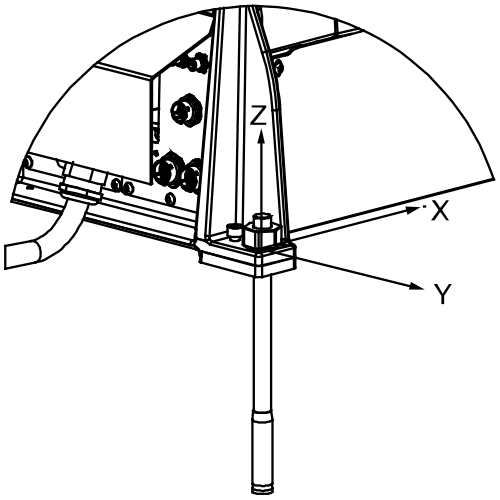
2.10 Operating requirements

Continued

Positioner type	Endurance load in operation (kN)		Max. load at emergency stop (kN)		Screw dim. (qty)
IRP C-1000	2.7	15	6.4	22.3	M20 (4)
IRPRBPI K-300	1	3.1	1.5	5	M20 (6)
IRP K-600	2	7	2	10.2	M20 (6)
IRP K-1000	2	7	2	10.2	M20 (6)
IRP L-300	0.5	5.2	1.8	8.9	M20 (4+4)
IRP L-600	1.2	12	2.2	18.8	M20 (4+4)
IRP L-1000	1.2	12	2.2	18.8	M20 (4+4)
IRP L-2000	1.7	25.7	3.7	36.7	M20 (5+4)
IRP L-5000	3.0	35.0	9.0	44.5	M20
IRP R-300	1.38	5.4	3	7.8	M16 (4)
IRP R-600	2.7	15	6.4	22.3	M20 (4)
IRP R-1000	2.7	15	6.4	22.3	M20 (4)



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3 Variants and options

3.1 Introduction to variants and options

General

The different variants and options for the IRP are described in the following sections. The same option numbers are used here as in the specification form.

The variants and options related to the robot controller are described in the product specification for the controller.

3.2 Positioner

Positioner type

See chapter *Description on page 9*. For more information about the controller options, see *Product specification - OmniCore V line*.

Option	Positioner type	Requirements on controller options
4000-1	IRP A-250	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-2	IRP A-250 x2	3000-410 OmniCore V400XT 4 pcs 3062-1 Additional drive units 3069-2x Connection box
4000-3	IRP A-500	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-4	IRP A-500 x2	3000-410 OmniCore V400XT 4 pcs 3062-1 Additional drive units 3069-2x Connection box
4000-5	IRP A-750	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-6	IRP A-750 x2	3000-410 OmniCore V400XT 4 pcs 3062-1 Additional drive units 3069-2x Connection box
4000-7	IRP B-250	3000-410 OmniCore V400XT 5 pcs 3062-1 Additional drive units 3069-2x Connection box
4000-8	IRP B-500	3000-410 OmniCore V400XT 5 pcs 3062-1 Additional drive units 3069-2x Connection box
4000-9	IRP B-750	3000-410 OmniCore V400XT 5 pcs 3062-1 Additional drive units 3069-2x Connection box
4000-10	IRP C-500	1 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-11	IRP C-1000	1 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-12	IRP L-300	1 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-13	IRP L-300 x2	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-14	IRP L-600	1 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-15	IRP L-600 x2	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-16	IRP L-1000	1 pcs 3062-1 Additional drive units 3069-xx Connection box

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Option	Positioner type	Requirements on controller options
4000-17	IRP L-1000 x2	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-18	IRP L-2000	1 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-19	IRP L-2000 x2	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-20	IRP L-5000	1 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-21	IRP L-5000 x2	2 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-22	IRP K-300	3 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-23	IRP K-600	3 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-24	IRP K-1000	3 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-25	IRP R-300	3 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-26	IRP R-600	3 pcs 3062-1 Additional drive units 3069-xx Connection box
4000-27	IRP R-1000	3 pcs 3062-1 Additional drive units 3069-xx Connection box

Manipulator color

Option	Color	RAL code[i]
209-202	ABB Graphite White (Standard color)	RAL7035

[i] The colors can differ depending on supplier and the material on which the paint is applied.

Note

The rule is that the moving parts are graphite white, except the shields / baffle walls which are always dark grey (RAL 7012). All other non-moving parts of the positioners plus the floor mounting base and the pedestals have the same dark grey color.

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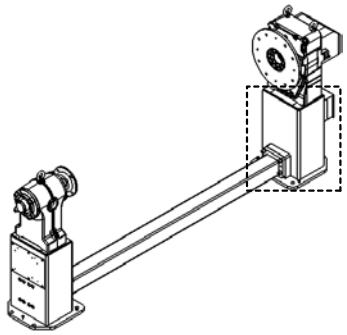
Stand for rotary unit



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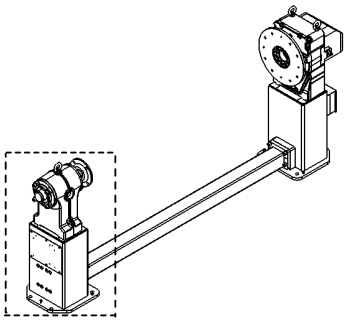
Option	Type	Description
4002-1	Stand L-300	Only with one IRP L-300
4002-2	Stand L-300 x2	Only with two IRP L-300
4002-3	Stand L-600/-1000	Only with one IRP L-600/-1000
4002-4	Stand L-600/-1000 x2	Only with two IRP L-600/-1000
4002-5	Stand L-2000	Only with one IRP L-2000
4002-6	Stand L-2000 x2	Only with two IRP L-2000
4002-7	Stand L-5000	Only together with one IRP L-5000
4002-8	Stand L-5000 x2	Only with two IRP L-5000

Tailstock for L positioner



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Option	Type	Description
4003-1	Tailstock L-300	Only with one IRP L-300
4003-2	Tailstock L-300 x2	Only with two IRP L-300
4003-3	Tailstock L-600/-1000	Only with one IRP L-600/-1000
4003-4	Tailstock L-600/-1000 x2	Only with two IRP L-600/-1000
4003-5	Tailstock L-2000	Only with one IRP L-2000
4003-6	Tailstock L-2000 x2	Only with two IRP L-2000
4003-7	Tailstock L-5000	Only with one IRP L-5000
4003-8	Tailstock L-5000 x2	Only with two IRP L-5000

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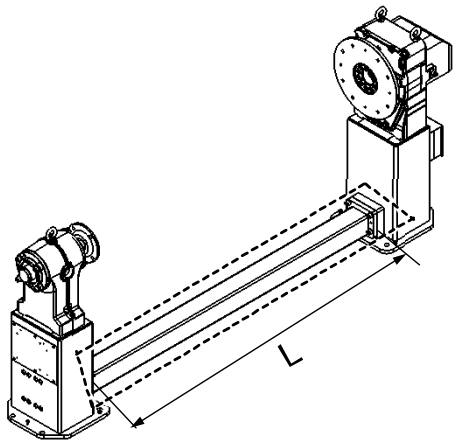
Distance beam for L positioner



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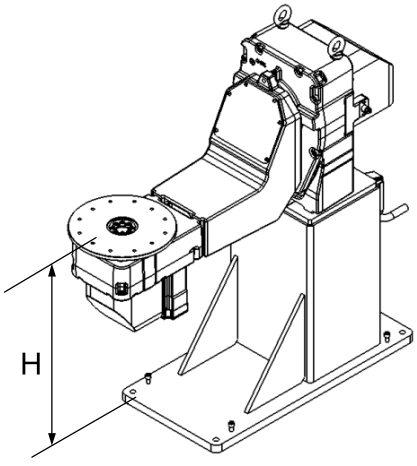
Option	Length (mm)	Description
4004-1	Beam L=1250	Only with one IRP L-300/-600/-1000/-2000
4004-2	Beam L=1250 x 2	Only with two IRP L-300/-600/-1000/-2000
4004-3	Beam L=1600	Only with one IRP L-300/-600/-1000/-2000
4004-4	Beam L=1600 x 2	Only with two IRP L-300/-600/-1000/-2000
4004-5	Beam L=2000	Only with one IRP L-300/-600/-1000/-2000
4004-6	Beam L=2000 x 2	Only with two IRP L-300/-600/-1000/-2000
4004-7	Beam L=2500	Only with one IRP L-300/-600/-1000/-2000
4004-8	Beam L=2500 x 2	Only with two IRP L-300/-600/-1000/-2000
4004-9	Beam L=3150	Only with one IRP L-300/-600/-1000/-2000
4004-10	Beam L=3150 x 2	Only with two IRP L-300/-600/-1000/-2000
4004-11	Beam L=4000	Only with one IRP L-300/-600/-1000/-2000
4004-12	Beam L=4000 x 2	Only with two IRP L-300/-600/-1000/-2000

Positioner height



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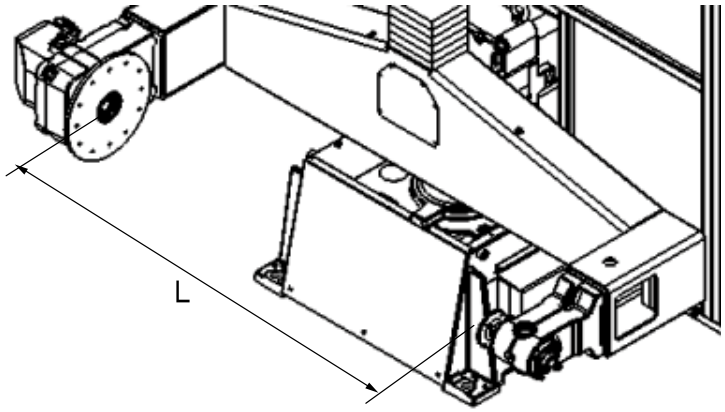
3.2 Positioner
Continued

Option	Height (mm)	Description
4004-1	H=700	Only with one or two IRP A-500/-750
4004-2	H=800	Only with one or two IRP A-500/-750 Default for C-500
4004-3	H=900	Only with one or two IRP A-500/-750 Default for A-250, B-250/500/750, C-1000, R-300
4004-4	H=950	Only with and default for IRP K-300/600/1000,L-300/300 x2/600/600 x2/1000/1000 x2/2000/2000 x2
4004-5	H=1200	Only with and default for IRP L-5000/5000 x2
4004-6	H=1035	Only with and default for IRP R-600/1000 (D=1200)

Positioner length



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Option	Length (mm)	Description
4005-1	L=1250	Only with IRP R-300, D-300
4005-2	L=1600	Only with IRP R-300/-600/-1000, K-300/-600/-1000
4005-3	L=2000	Only with IRP R-600/-1000, K-300/-600/-1000
4005-4	L=2500	Only with IRP K-300/-600/-1000
4005-5	L=3150	Only with IRP K-300/-600/-1000
4005-6	L=3500	Only with IRP K-300/-600/-1000
4005-7	L=4000	Only with IRP K-300/-600/-1000

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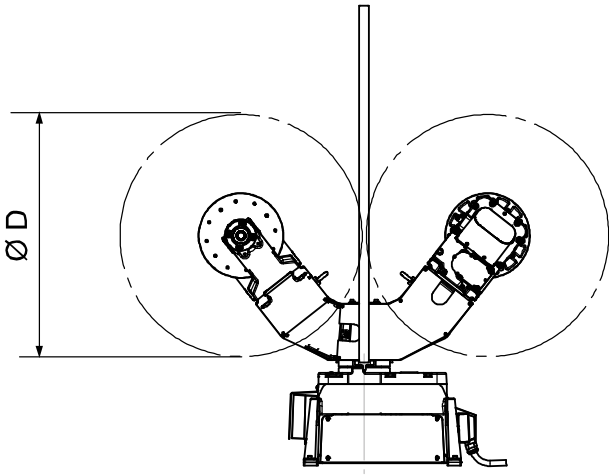
Positioner diameter



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Option	Diameter (mm)	Description
4006-1	D=1000 (R)	Only with IRP R-300/-600/-1000
4006-2	D=1000 (K)	Only with IRP K-300
4006-3	D=1000 (A)	Only with one or two IRP A-500/-750
4006-4	D=1200 (R)	Only with IRP R-600/-1000
4006-5	D=1200 (K)	Only with IRP K-300/-600/-1000
4006-6	D=1400 (K)	Only with IRP K-600/-1000
4006-7	D=1450 (A)	Only with one or two IRP A-500/-750

Swivels and slip rings

See *Swivels on page 122*.

Option	Type	Description
4007-1	1 air (L/A/C)	1 ch air. For one IRP L-300/-600/-1000/-2000/-5000, one IRP A-250/-500/-750, IRP C-500/1000
4007-2	1 air (L/A) x 2	1 ch air. For two IRP L-300/-600/-1000/-2000/-5000, two IRP A-250/-500/-750
4007-3	2 air (L/A/C)	2 ch air. For one IRP L-300/-600/-1000/-2000/-5000, one IRP A-250/-500/-750, IRP C-500/1000
4007-4	2 air (L/A) x 2	2 ch air. For two IRP L-300/-600/-1000/-2000/-5000, two IRP A-250/-500/-750
4007-5	10 el. (L/A)	10 ch electr. sign. For one IRP L-300/-600/-1000/-2000/-5000, one IRP A-250/-500/-750
4007-6	10 el. (L/A) x 2	10 ch electr. sign. For two IRP L-300/-600/-1000/-2000/-5000, two IRP A-250/-500/-750

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Option	Type	Description
4007-7	10 el. + 1 air (L/A)	10 ch electr. sign. + 1 ch air. For one IRP L-300/-600/-1000/-2000/-5000, one IRP A-250/-500/-750
4007-8	10 el. + 1 air (L/A) x 2	10 ch electr. sign.+ 1 ch air. For two IRP L-300/-600/-1000/-2000/-5000, two IRP A-250/-500/-750
4007-9	1 air (R/K/B/D)	1 ch air. For IRP R-300/-600/-1000, IRP K-300/-600/-1000, IRP B-250/-500/-750, IRP D-300/-600
4007-10	2 air (R/K/B/D)	2 ch air. For IRP R-300/-600/-1000, IRP 250/500/750K, IRP B-250/-500/-750, IRP D-300/-600
4007-11	10 el. (R/K/B/D)	10 ch electr. sign. For IRP R-300/-600/-1000, IRP K-300/-600/-1000, IRP B-250/-500/-750, IRP D-300/-600
1208-12	10 el. + 1 air (R/K/B/D)	10 ch electr. sign.+ 1 ch air. For IRP R-300/-600/-1000, IRP K-300/-600/-1000, IRP B-250/-500/-750, IRP D-300/-600

Extra current collector

See *Extra current collector for positioner types K / L / R on page 128*.

Option	Type	Description
4008-1	Current collector (L)	For one IRP L-300/-600/-1000/-2000/-5000
4008-2	Current collector (L)x2	For two IRP L-300/-600/-1000/-2000/-5000
4008-3	Current collector	For IRP R-300/-600/-1000, IRP K-300/-600/-1000

Weld current cable

Extra weld return cable.

Option	Length	Description
4009-1	7 m	
4010-1	10 m	
4011-1	15 m	

Return cable OKC T-connection

Option	Qty	Description
4012-1	1 or 2 (chose quantity)	Only for IRP L / Extra current collector

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Warranty

For the selected period of time, ABB will provide spare parts and labor to repair or replace the non-conforming portion of the equipment without additional charges. During that period, it is required to have a yearly *Preventative Maintenance* according to ABB manuals to be performed by ABB. If due to customer restrains no data can be analyzed with ABB Connected Services for robots with OmniCore controllers, and ABB has to travel to site, travel expenses are not covered. The *Extended Warranty* period always starts on the day of warranty expiration. Warranty Conditions apply as defined in the *Terms & Conditions*.

Note

This description above is not applicable for option *Stock warranty* [438-8]

Option	Type	Description
438-1	Standard warranty	Standard warranty is 12 months from *Customer Delivery Date* or latest 18 months after *Factory Shipment Date*, whichever occurs first. Warranty terms and conditions apply.
438-2	Standard warranty + 12 months	Standard warranty extended with 12 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements.
438-4	Standard warranty + 18 months	Standard warranty extended with 18 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements.
438-5	Standard warranty + 24 months	Standard warranty extended with 24 months from end date of the standard warranty. Warranty terms and conditions apply. Contact Customer Service in case of other requirements.
438-6	Standard warranty + 6 months	Standard warranty extended with 6 months from end date of the standard warranty. Warranty terms and conditions apply.
438-7	Standard warranty + 30 months	Standard warranty extended with 30 months from end date of the standard warranty. Warranty terms and conditions apply.
438-8	Stock warranty	Maximum 6 months postponed start of standard warranty, starting from factory shipment date. Note that no claims will be accepted for warranties that occurred before the end of stock warranty. Standard warranty commences automatically after 6 months from *Factory Shipment Date* or from activation date of standard warranty in WebConfig. **Note** Special conditions are applicable, see *Robotics Warranty Directives*.

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