HIGH POWER
Nutrunning Equipment

Product Catalog E 1

Built-In Nutrunner and Multi-Channel Controls

E 1

Revision 04/2012

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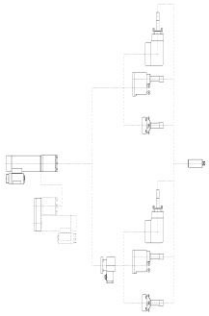

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HIGH POWER Built-In Nutrunner

E 1.0

Primary Features

Powerful – Intelligent – Economical

AMT built-in nutrunner are your ideal choice when it comes to safe fastening operations with consistently high accuracy. As partners with the automotive industry, we offer innovative and high-performance nutrunning systems that meet or exceed the rigid demands from our customer base.

All From One Source

Nutrunner and assembly technology are our core competences. The unique synergistic effects from this have enabled AMT to rule the complex world of fastening systems and assembly like no other. As an innovative partner of the automotive industry for many years now, we recognize the demands and needs of our customer base. As builders of custom machines, we are also capable of supplying you with multi-purpose handheld nutrunners, nutrunner modules that are ready to be built into your system, or complete nutrunner stations. We assume responsibility for project engineering, design, assembly, and installation.

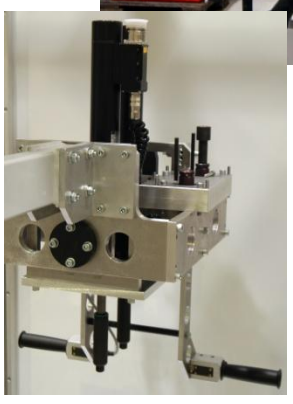
It is no wonder that many customers choose AMT for their nutrunning needs. A single partner for all applications related to the nutrunning process reduces planning and coordination efforts, which in turn reduces your overall cost.

Safety in Assembly

The quality of a fastened connection does not depend solely on the use of high-quality nutrunners. It also depends upon the operators who are using these tools. While considering solutions for our customers, therefore, we do not just think about the individual connections but also include the tool operator and configuration of his/her workstation in our design process. By doing this, errors can be avoided with the appropriate workstation layout. Fault recognition and troubleshooting, using innovative monitoring strategies, remains front and center.

Our nutrunner systems are, for example, capable of monitoring the correct fastening position, using camera, ultrasonic triangulation, or our patented Railnet system. As a result, missing fasteners and/or operations at the wrong fastener location are detected and avoided.

Of course, all data stored by the nutrunner control is available over network interfaces for documentation and additional processing by higher order computer systems.



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HIGH POWER Compact Nutrunner KCX

E 1.0.1

Primary Features

Small, Lightweight, Powerful

The new built-in nutrunners from the KCX Series are ultra-compact and extremely lightweight. They were developed especially for applications where nutrunner space requirements and weight play a critical role. This is true for all applications where single or multi-channel nutrunner systems are used in very narrow work areas. Examples for this are robotic applications, e.g. the assembly of sunroofs or airbags.

Our new KCX nutrunners are, however, not only compact and lightweight; they are also very fast. With the use of a newly developed, high-dynamic motor, it is possible to increase nutrunner power, compared to previous generations, by up to 35%. This saves fastening time ... you save money.

Robust Design

Compact nutrunners in the KCX series from AMT are designed for rugged industrial applications. Both motor and gearbox are configured for long-life operation. This robust design leads to an increase in lifetime and, as a result, a minimum in maintenance costs.

Integrated Data Chip

Compact nutrunners in the KCX series also feature an integrated data chip that stores all relevant spindle data. This data can be automatically read on any AMT control, as soon as a new tool is connected to the control. Time consuming and tedious parameter definitions become a thing of the past. The data chip also stores the number of executed fastening cycles. This allows for the development of individualized service intervals, in line with preventive maintenance.

Safeguarding the Fastening Process

All KCX compact nutrunners have reaction torque sensors, in addition to gathering rotation angle data from the resolver. As a result, fastening processes are performed with maximum precision and consistent quality. While recording the rotation angle, the control monitors whether or not the specified torque is actually being applied to the fastened assembly. In addition, the tool's current consumption, equivalent to the torque, is used as a redundant control variable in all AMT controls. By doing this, all requirements for safe, reliable, and high quality fastened assemblies are met.

Technical Data

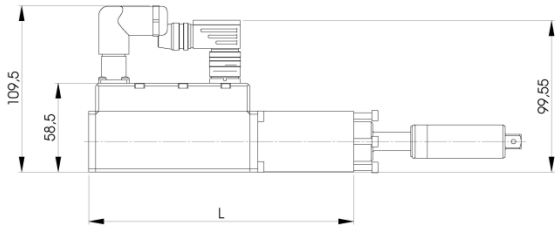
Torque up to 48 Nm
Speed up to 1481 rpm

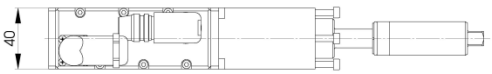
General
- Brushless drive motor with a linear Hall sensor for rotary positioning.
- Integrated data chip for
  - spindle identification
  - fastening cycle counter
- Reaction torque sensor
- Minimum speed: 0 rpm
- Angle accuracy: 3 , absolute
- Fastening torque tolerance: 7% Cm/Cmk ≥ 1,67

Compact Nutrunner KCX

E 1.0.1

Reaction Torque Sensor



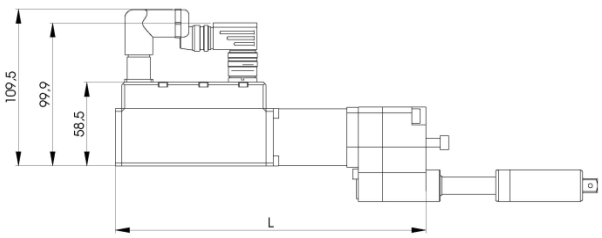


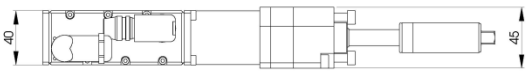
Centric Drive with Spring Travel

Max. torque capacity in Nm	Type	Max. idle speed rpm	Length mm	Spring Travel mm	Weight mm	Ident-No.
13	KCX1013ZF25	1481	174	25	1,00	7920723
25	KCX1025ZF25	772	174	25	1,00	7920724
48	KCX1048ZF25	381	194	25	1,10	7920725

Centric Drive with Square Drive

Max. torque capacity in Nm	Type	Max. idle speed rpm	Length mm	Drive	Weight mm	Ident-No.
13	KCX1013ZV38	1481	174	3/8"	0,95	7920729





Offset Drive with Spring Travel

Max. torque capacity in Nm	Type	Max. idle speed rpm	Length mm	Spring Travel mm	Weight mm	Ident-No.
13	KCX1013OF25	1388	218	25	1,35	7920726
25	KCX1025OF25	723	218	25	1,35	7920727
48	KCX1048OF25	357	257	25	1,60	7920728

Offset Drive with Square Drive

Max. torque capacity in Nm	Type	Max. idle speed rpm	Length mm	Drive	Weight mm	Ident-No.
13	KCX1013OV38	1388	218	3/8"	1,30	7920730

HIGH POWER Built-In Nutrunner

E 1.0.2

Primary Features

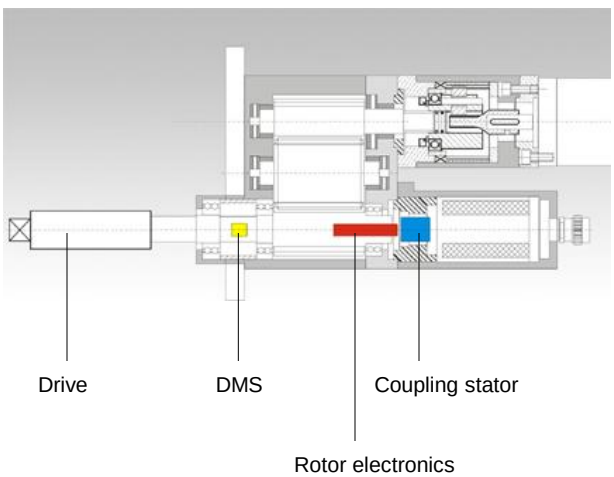
Powerful-Intelligent-Economical

Our new HIGH POWER built-in nutrunners are setting new market standards for power and economy. Automatic nutrunner stations demand short rundown times with high tool availability and reliability. For this reason, we implement only maintenance-free and high-dynamic EC motors.
By combining standard subassemblies for drive and output, built-in nutrunners can be configured for just about any application available.

Our built-in nutrunners are also "intelligent". They transfer their personal characteristics automatically to our nutrunner controls and also keep track of their own preventive maintenance schedule.

Action Torque Data Sensors for Highest Accuracy

AMT built-in nutrunners represent the highest accuracy for tightening fastened connections. For this reason, we recommend the use of action torque data sensors for capturing torque data. The torque is measured as closely as possible to the fastened location, i.e., directly on the output shaft. As a result, changes in the efficiency of right angle or offset gearboxes, due to wear, have no influence on the torque. As soon as the tightening torque is achieved, the fastening process is reliably executed, independent of the mechanical condition of the gearbox.



Expanded Process Safety through Redundance

VDI Guidelines 2826 recommend the use of redundant torque sensors for Category A fastening operations (with medium or direct risk to life and limb). AMT nutrunners capture the fastening values for these configurations as follows:

Control Circuit:
• Torque captured by action torque data sensor
• Angle captured from encoder

Check Circuit
• Torque captured by a reaction gauge sensor
• Angle captured from resolver

The transfer and evaluation of each of the measured values from the control and check circuits are carried out independently, up to the final comparison. Any deviations in the compared values creates a fault condition with message.

Added Advantage:
A continuous monitoring of these measured values can extend the timeframe considerably before dynamic reference measurements are required with external, plugged-in torque sensors.

Integrated Maintenance Management

Even the most reliable tools suffer from natural wear over time. In order to keep this wear from progressing to an unexpected breakdown and potential stoppage of an assembly line, AMT nutrunners automatically signal when preventive maintenance is required. An integrated nutrunning cycle counter with a load-dependent evaluation ensures that required maintenance is signaled before a tool breaks down. This increases tool availability while, at the same time, reducing maintenance costs that occur from having to replace parts due to wear.

Modular Design Means Reduced Overhead

Built-in nutrunners from AMT are modular in design, i.e., individual components, such as output spindle variants, can be combined to meet production demands. Built-in nutrunners can be easily and completely removed for repair or maintenance purposes.

“Only replace what is absolutely necessary!”

HIGH POWER Built-In Nutrunner ECR

E 1.0.3

Overview

- **Built-In Nutrunner – Centric Drive Size 1 - 4**

  Torque up to 1200 Nm
  Speed up to 1200 rpm

- **Built-In Nutrunner – Offset Drive Size 1 - 3**

  Torque up to 1075 Nm
  Speed up to 1120 rpm

- **Built-In Nutrunner – Angle Drive Size 1 - 3**

  Torque up to 642 Nm
  Speed up to 1200 rpm

- **Technical Data**

	Nutrunner Configuration Variant 1 (see page 14)	Nutrunner Configuration Variant 2 + 3 (see page 15-17)
Tightening Torque Tolerance	+/- 15% mit cm / cmk >= 1,67 within specified application range	+/- 7% mit cm / cmk >= 1,67 within specified application range
Angle Precision	+/- 3 degrees, absolute	+/- 3 degrees, absolute
Minimum Speed	10 rpm at Mdmax	0 rpm at Mdmax
Maximum Cable Length	<= 50 meters longer available upon request	<= 50 meters longer available upon request

- **Certificate for Quality Tools**

  Machine capability per ISO 5393
  Homologation test

HIGH POWER Built-In Nutrunner ECR E 1.0.4

Subassemblies

ECR – Drives

Highest demands for shutdown accuracy, as well as short cycle times, require the use of high-performance drives. For this reason, only high-dynamic, maintenance-free EC motors are used in our nutrunners. These drives, in combination with our long-lasting, low-maintenance planetary gearboxes, are ideal for high performance under rugged operating conditions. The motor is configured with a resolver for torque and speed control, as well as for measuring tightening and loosening angle. The angle resolution in our standard nutrunners has a minimum value of 1 degree.

A data chip is integrated into the drive which stores all relevant tool characteristic data, nutrunning cycle counter, and a load-independent maintenance cycle counter. A data sensor integrated in the tool can be used to retrieve this data and transfer it to the nutrunner control.

Q – Gearbox

By redirecting the drive line over a transverse gearbox, the length of the spindle can be reduced considerably. The power is transferred over three gears. The model-dependent transmission ratio, as well as efficiency, are listed in the data sheet below and must be considered separately when configuring the complete nutrunner.

AOD – Offset Gearbox
AWD – Right Angle Gearbox

AOD – offset gearboxes and AWD right angle gearboxes are configured with integrated data sensors. Torque is measured directly at the rotating output shaft (action torque sensor) and transferred without contact to the sensor‘s evaluation electronics. The measured values are then converted to digital and sent to the nutrunner control.

AZ – Centric Drive

If no particular demands are placed on the nutrunner geometry, then a centric drive can be used. This can be configured, like the offset and right angle drive, with an output shaft for 25 or 50mm sockets (Size 3 can accommodate some 60mm sockets).

W – Angle Encoder

If an additional angle measuring system is required with the AOD - offset or AWD - right angle gearbox (e.g., when configuring a redundant system), an angle encoder from the W-series is used. the angle resolution is 0.5 degrees.

DR- / DWR – Data Sensors

These cost-efficient data sensors are installed between the drive and ouput spindles. Torque is measured indirectly by these sensors from the reaction torque (reaction torque sensor). The DWR - data sensor has an additional angle measuring system over the DR data sensor.

DR- and DWR-Series data sensors are used:
- in control circuits, for purely economical reasons
- as redundant data sensors in connection with an action torque sensor
- for measuring checks using an external gauge set (only DWR)

Note:
For data sensor travel perpendicular to the axis direction, the acceleration / deceleration is limited to max. 15 m/s^2.

DA- / DWA – Data Sensors

The DA- and DWA-Series data sensors are used with inline output spindles. The torque is measured directly on the rotating drive shaft (action torque sensor) and transferred without contact to the sensor‘s evaluation electronics. There the data are converted to digital and sent to the nutrunner control. DWA data sensors also have an integrated angle measurement system.

DA- and DWR-Series data sensors offer:
- increased work speed in the final tightening phase
- broader nutrunner application area

A resolution of 0.5 degrees can be achieved with the optional angle measuring system.

Adapter

If two data sensors are implemented in a series (e.g., for a redundant system or calibration with external gauge), then the cable connections are opposite each other. Due to space requirements or installation location, it might be necessary to locate the cable connectors on top of each other. The A adapter module is designed for this purpose.

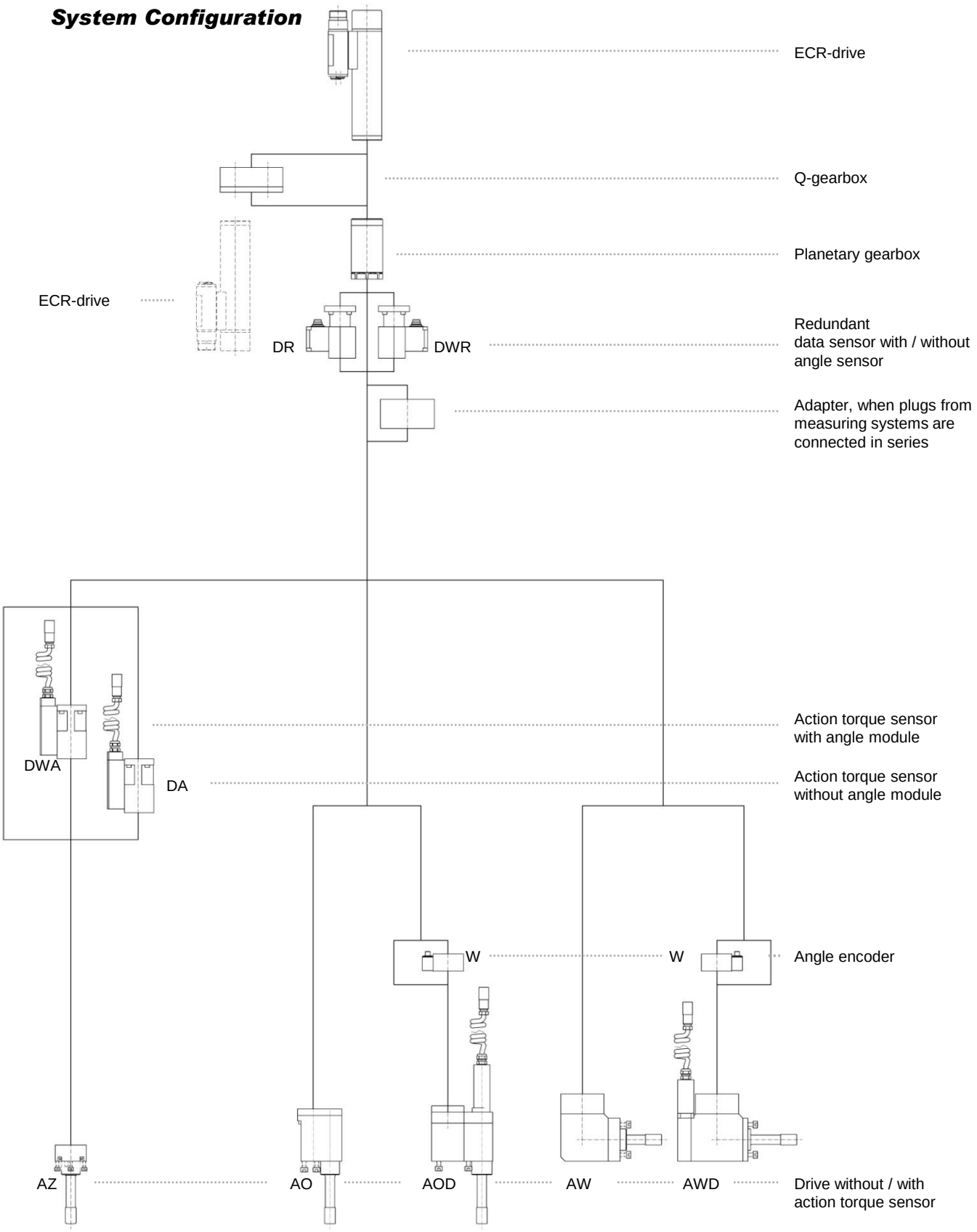
Integrated Data Storage

All AMT data sensors have a data chip integrated in the drive which stores all relevant tool characteristics, a nutrunning cycle counter, and a maintenance cycle counter. The data sensor in the control circuit reads the drive data chip, adds some information of its own, and forwards this data packet to the nutrunner control. This eliminates the need for manual parameter input for the tool into the nutrunner control. This function is not available with tool configurations that do not include data sensors.

HIGH POWER Built-In Nutrunner ECR

E 1.0.5

System Configuration



HIGH POWER Built-In Nutrunner E 1.0.6

Nutrunner Configuration - Selection Process

Block Diagrams

Block diagrams for typical application examples are presented on pages 14 - 17. These are designed to simplify the selection process for the nutrunner best suited for each application. Selection criteria include:

- type and number of data sensors
- required torque
- design configuration (centric drive, offset or angle drive)

A cross-reference to the technical data sheet for the appropriate built-in nutrunner is included based on this selection.

The following additional resources should also be considered during built-in nutrunner selection and/or review:

- Hole Pattern Chart
  (see pages 23 - 27)
- Formula for Calculating Rundown Time
  (see page 18)
- Duty Cycle Benchmarks
  (see pages 19 - 22)

Classification

The block diagrams are arranged according to the following classifications:

Variant 1 (page 14):

Application Scope:	Secondary fastening operations that don‘t require documentation
Type of Operation:	Tacking operations, pin insertion for overlapping joints, loosening operations, etc.
Option:	Integrated data sensor for random sample calibration using portable gauging equipment

Variant 2 (pages 15 - 16):

Application Scope:	High-precision fastening operations
Type of Operation:	All fastening operations based on torque and rotation angle (including yield-point tightening)
Options:	Action torque sensor; integrated data sensor for random sample calibration using portable gauging equipment

Variant 3 (page 17):

Application Scope:	Redundant system (based on VDI 2826 guidelines for Category A fastening operations)
Type of Operation:	All fastening operations based on torque and rotation angle (including yield-point tightening)
Option:	Integrated data sensor for random sample calibration using portable gauging equipment

HIGH POWER Built-In Nutrunner

E 1.0.6

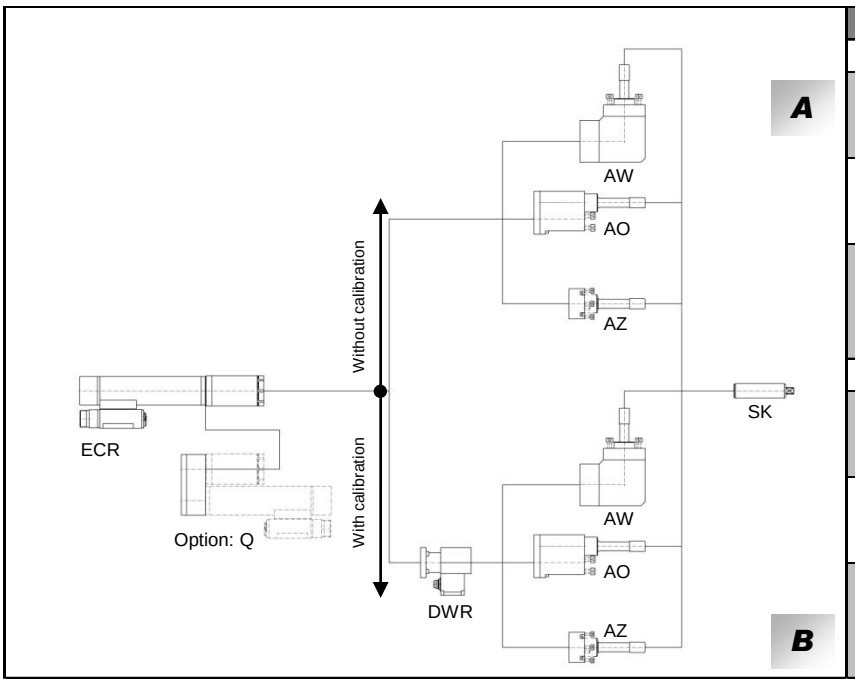
Nutrunner Configurations

Nutrunner Configuration Variant 1:

Application Scope: Secondary fastening operations that don‘t require documentation

Type of Operation: Tacking operations, pin insertion for overlapping joints, loosening operations, etc.

Option: Integrated data sensor for random sample calibration using portable gauging equipment



Drive	Application Area	Page/Block
AW	12 - 43 Nm	70 / A
	19 - 171 Nm	74 / A
	87 - 540 Nm	78 / A
AO	12 - 45 Nm	50 / A
	20 - 189 Nm	54 / A
	94 - 967 Nm	58 / A
AZ	11 - 45 Nm	32 / A
	17 - 186 Nm	36 / A
	79 - 395 Nm	40 / A
	359 - 1076 Nm	44 / A
AW	12 - 43 Nm	70 / B
	19 - 171 Nm	74 / B
	87 - 540 Nm	78 / B
AO	12 - 45 Nm	50 / B
	20 - 189 Nm	54 / B
	94 - 967 Nm	58 / B
AZ	11 - 45 Nm	32 / B
	17 - 186 Nm	36 / B
	79 - 395 Nm	40 / B
	359 - 1076 Nm	44 / A

Note: For applications with Q-gearboxes (transverse), the nutrunner data is modified by the gearbox factor

Socket : See page 86 for technical data on sockets

HIGH POWER Built-In Nutrunner

E 1.0.6

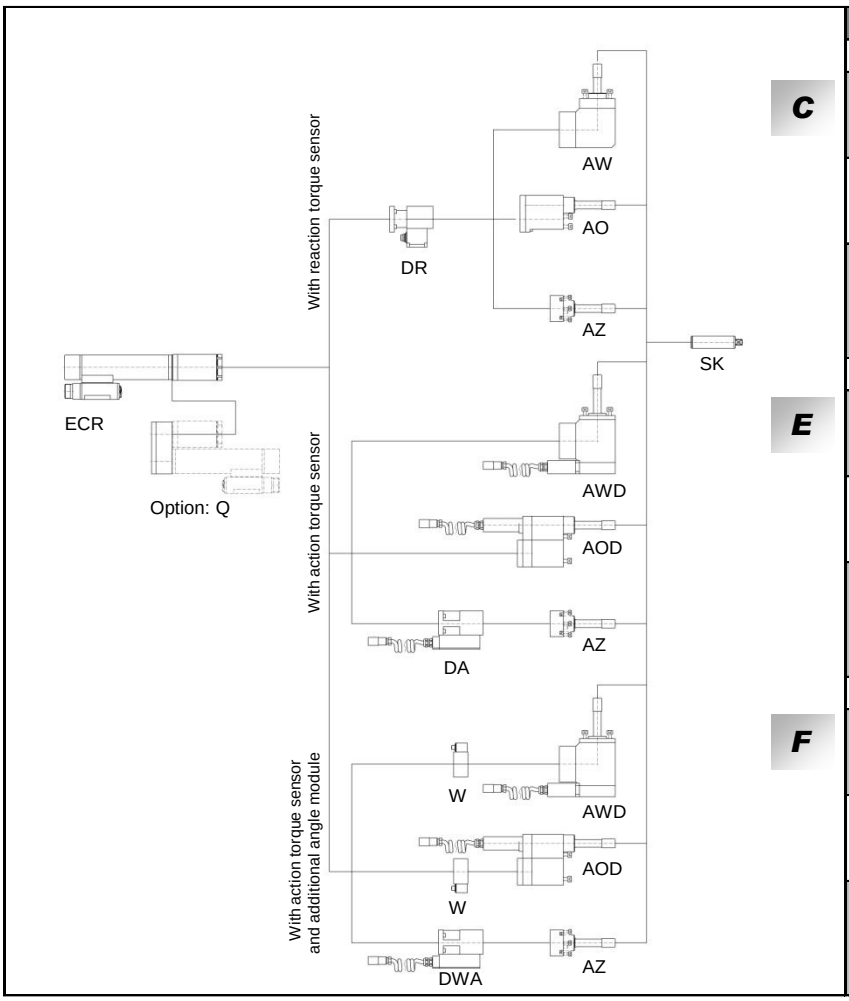
Nutrunner Configurations

Nutrunner Configuration Variant 2a:

Application Scope: High-precision nutrunning operations

Type of Operation: All nutrunning operations based on torque and angle

Option: Action torque sensor



	Drive	Application Area	Page/Block
C	AW	7 - 42 Nm	70 / C
		11 - 135 Nm	74 / C
		50 - 540 Nm	80 / C
	AO	7 - 45 Nm	50 / C
		11 - 182 Nm	54 / C
		54 - 967 Nm	60 / C
	AZ	11 - 45 Nm	32 / C
		9 - 180 Nm	36 / C
		40 - 395 Nm	40 / C
		180 - 1076 Nm	44 / C
E	AWD	2 - 43 Nm	72 / E
		6 - 176 Nm	76 / E
		25 - 540 Nm	82 / E
	AOD	4 - 45 Nm	52 / E
		6 - 180 Nm	56 / E
		27 - 900 Nm	62 / E
	AZ	4 - 45 Nm	34 / E
		6 - 180 Nm	38 / E
		27 - 395 Nm	42 / E
		120 - 1076 Nm	44 / E
F	AWD	2 - 43 Nm	72 / F
		6 - 176 Nm	76 / F
		25 - 540 Nm	82 / F
	AOD	4 - 45 Nm	52 / F
		6 - 180 Nm	56 / F
		27 - 900 Nm	61 / F
	AZ	4 - 45 Nm	34 / F
		6 - 180 Nm	38 / F
		27 - 395 Nm	42 / F
		120 - 1076 Nm	44 / F

Note: For applications with Q-gearboxes (transverse), the nutrunner data is modified by the gearbox factor

Socket : See page 86 for technical data on sockets

HIGH POWER Built-In Nutrunner

E 1.0.6

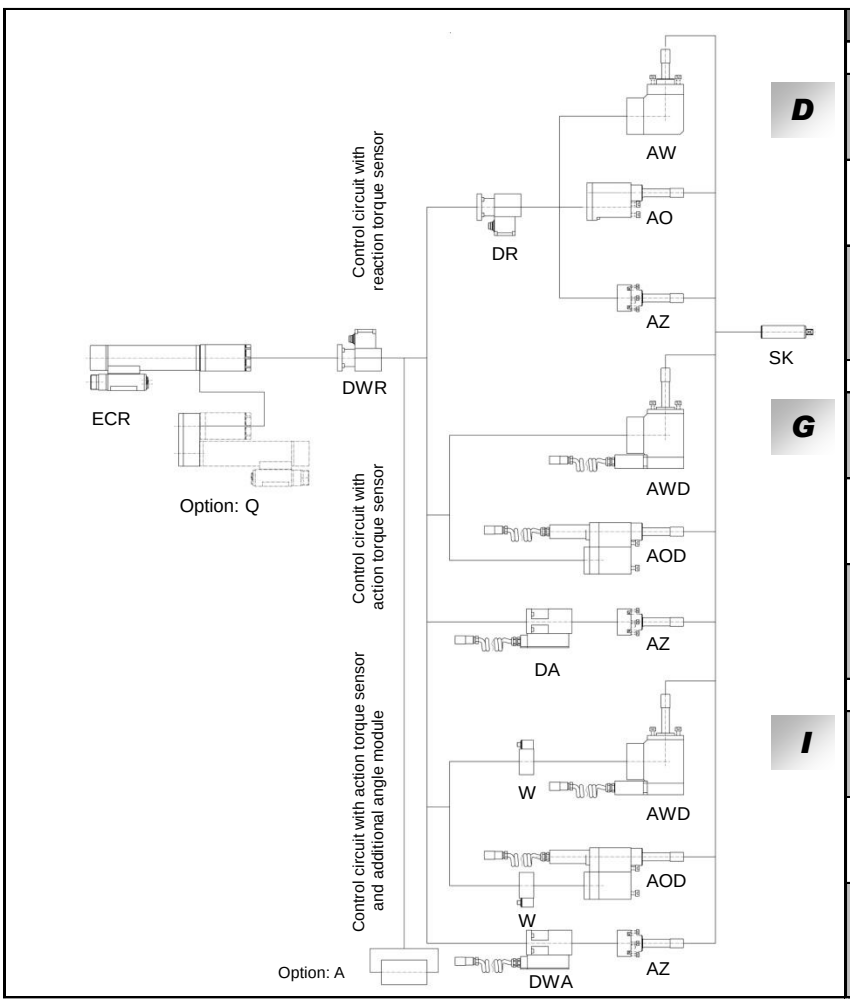
Nutrunner Configurations

Nutrunner Configuration Variant 2b:

Application Scope: High-precision nutrunning operations with demands for additional calibration using a built-in data sensor

Type of Operation: All nutrunning operations based on torque and angle

Option: Action torque sensor



Drive	Application Area	Page/Block
AW	7 - 42 Nm	70 / D
	11 - 135 Nm	74 / D
	50 - 540 Nm	80 / D
AO	7 - 45 Nm	50 / D
	11 - 182 Nm	54 / D
	54 - 967 Nm	60 / D
AZ	11 - 45 Nm	32 / D
	9 - 180 Nm	36 / D
	40 - 395 Nm	40 / D
	180 - 1076 Nm	44 / D
AWD	2 - 43 Nm	72 / G
	6 - 176 Nm	76 / G
	25 - 540 Nm	82 / G
AOD	4 - 45 Nm	52 / G
	6 - 180 Nm	56 / G
	27 - 900 Nm	62 / G
AZ	4 - 45 Nm	31 / G
	6 - 180 Nm	35 / G
	27 - 395 Nm	39 / G
	120 - 1076 Nm	44 / G
AWD	2 - 43 Nm	72 / I
	6 - 176 Nm	76 / I
	25 - 540 Nm	82 / I
AOD	4 - 45 Nm	52 / I
	6 - 180 Nm	56 / I
	27 - 900 Nm	64 / I
AZ	4 - 45 Nm	34 / I
	6 - 180 Nm	38 / I
	27 - 395 Nm	42 / I
	120 - 1076 Nm	44 / I

Note: For applications with Q-gearboxes (transverse), the nutrunner data is modified by the gearbox factor

Socket : See page 86 for technical data on sockets

HIGH POWER Built-In Nutrunner

E 1.0.6

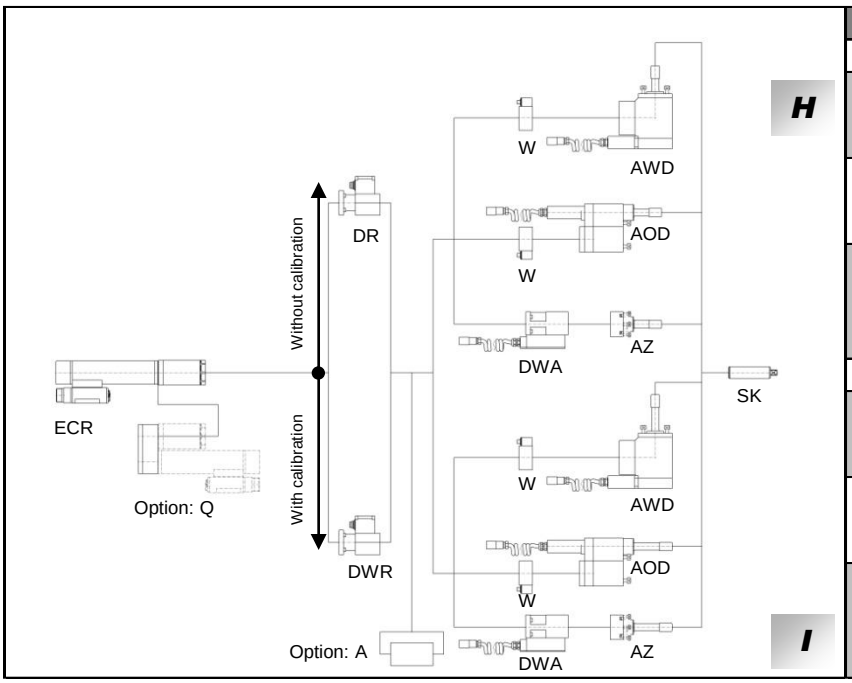
Nutrunner Configurations

Nutrunner Configuration Variant 3:

Application Scope: Redundant system
(according to VDI Guidelines 2826 for Category A nutrunning operations)

Type of Operation: All nutrunning operations based on torque and angle

Option: Sensors for random calibration



Drive	Application Area	Page/Block
AWD	2 - 43 Nm	72 / H
	6 - 176 Nm	76 / H
	25 - 540 Nm	82 / H
AOD	4 - 45 Nm	52 / H
	6 - 180 Nm	56 / H
	27 - 900 Nm	64 / H
AZ	4 - 45 Nm	34 / H
	6 - 180 Nm	38 / H
	27 - 395 Nm	42 / H
	120 - 1076 Nm	44 / H
AWD	2 - 43 Nm	72 / I
	6 - 176 Nm	76 / I
	25 - 540 Nm	82 / I
AOD	4 - 45 Nm	52 / I
	6 - 180 Nm	56 / I
	27 - 900 Nm	64 / I
AZ	4 - 45 Nm	34 / I
	6 - 180 Nm	38 / I
	27 - 395 Nm	42 / I
	120 - 1076 Nm	44 / I

Note: For applications with Q-gearboxes (transverse), the nutrunner data is modified by the gearbox factor

Socket : See page 86 for technical data on sockets

HIGH POWER Built-In Nutrunner

E 1.0.7

Calculating Rundown Time

Formula for Benchmark Calculation

The following formula can be used to calculate benchmark values for a 2-step tightening process.

The application-dependent time constant ***K*** represents::

- nutrunner synchronization prior to the start of the 2nd tightening step
- evaluation times for pre- and final tightening
- a counterclockwise impulse to unclamp (release) the socket upon completion of the tightening process

$$t_s = \frac{W \times 60}{n} + K + (AS \times 0{,}06) = \text{rundown time in seconds}$$

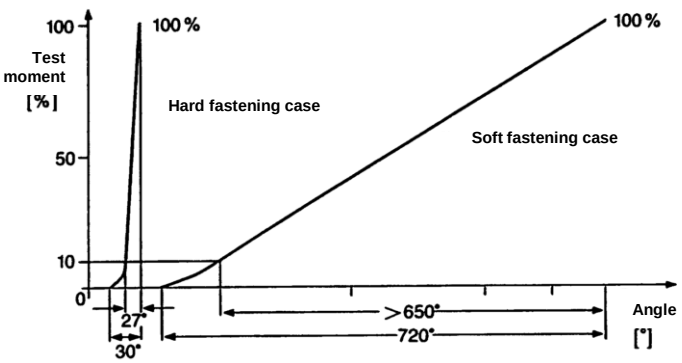
t_s = rundown time in seconds
W = tightening path in rotations (up to head contact)
n = work speed in rpm
60 = conversion factor: minutes to seconds
AS = number of active nutrunners
K = application-dependent time constant (see table below):

Conditions	Time Constant *K*
hard (30°)	1.8
med. hard (120°)	2.1
med. soft (1 rotation)	3.1
soft (3 rotations)	5.8

Fastening Cases Differentiated by ISO 5393:

Hard fastening case:
The predefined tightening torque is reached within a fixed tightening angle of up to 30 degrees.

Soft fastening case:
The tightening torque is reached in excess of 720 degrees.



HIGH POWER Built-In Nutrunner

E 1.0.8

Duty Cycle - ECR1... Built-In Nutrunner

Application Example from Page 34:

Application examples for checking valid duty cycles on ECR1 ... Series (without Q-gearbox):

Nutrunner:	ECR105 DA50 AZ150
Max. torque capacity.:	51 Nm
Required torque:	37.5 Nm
Nutrunning process:	2-step tightening process, metric thread
Operating conditions:	medium soft (ca. 1 rotation)
Cycle time:	20 seconds

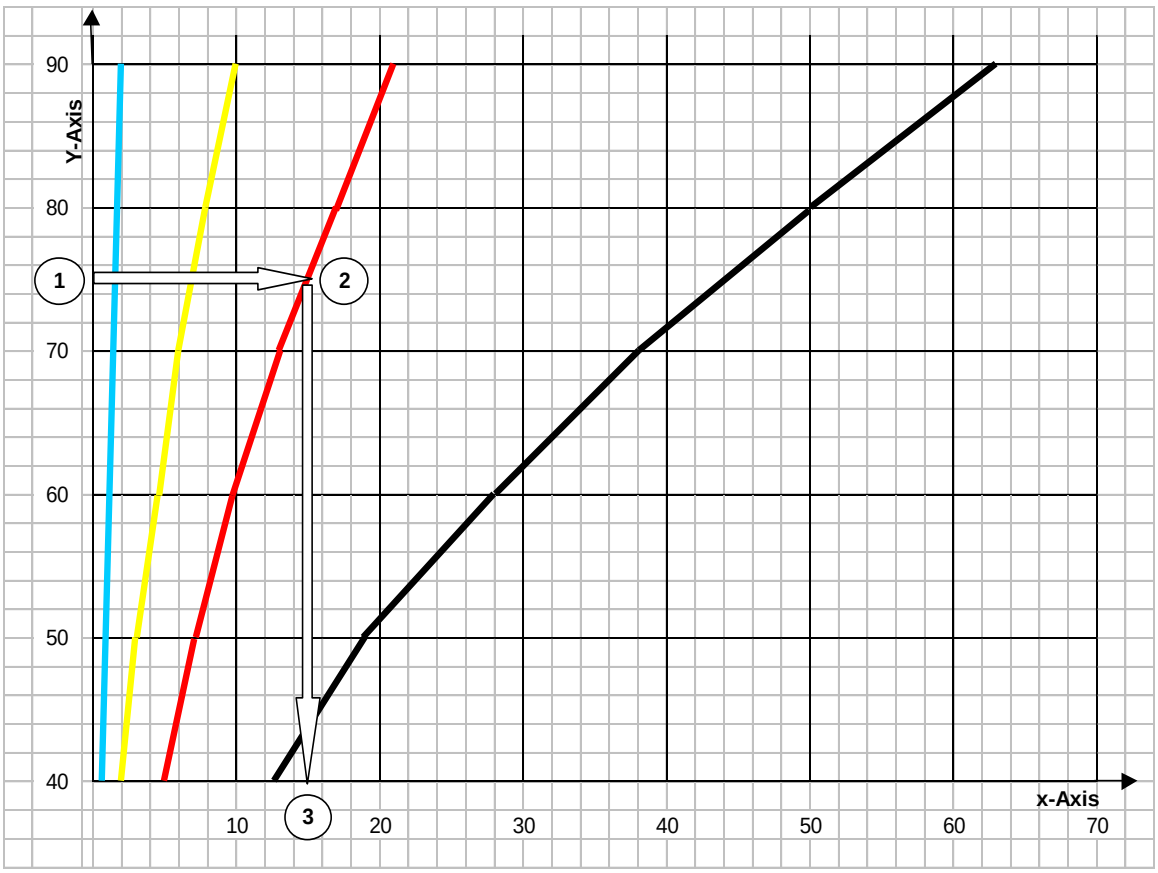
Procedure:

1. Select the torque on the y-axis in the benchmark chart. Note that the tightening torque is indicated as a % of the max. nutrunner capacity (Example: 37.5 Nm = 75% of 50 Nm).

2. Read across to the curve corresponding to the operating conditions (medium soft in this example) and continue down to read the corresponding value on the x-axis.

3. The value on the x-axis represents the minimum cycle time (15 seconds in this example). If the cycle time required is less than this value, then a higher-performance nutrunner must be selected.

Md as % of max. nutrunner capacity



Cycle time (seconds)

Operating Condition Curves:

- hard (ca. 30)
- medium hard (ca. 120)
- medium soft (ca. 1 rotation)
- soft (ca. 3 rotations)

HIGH POWER Built-In Nutrunner

E 1.0.8

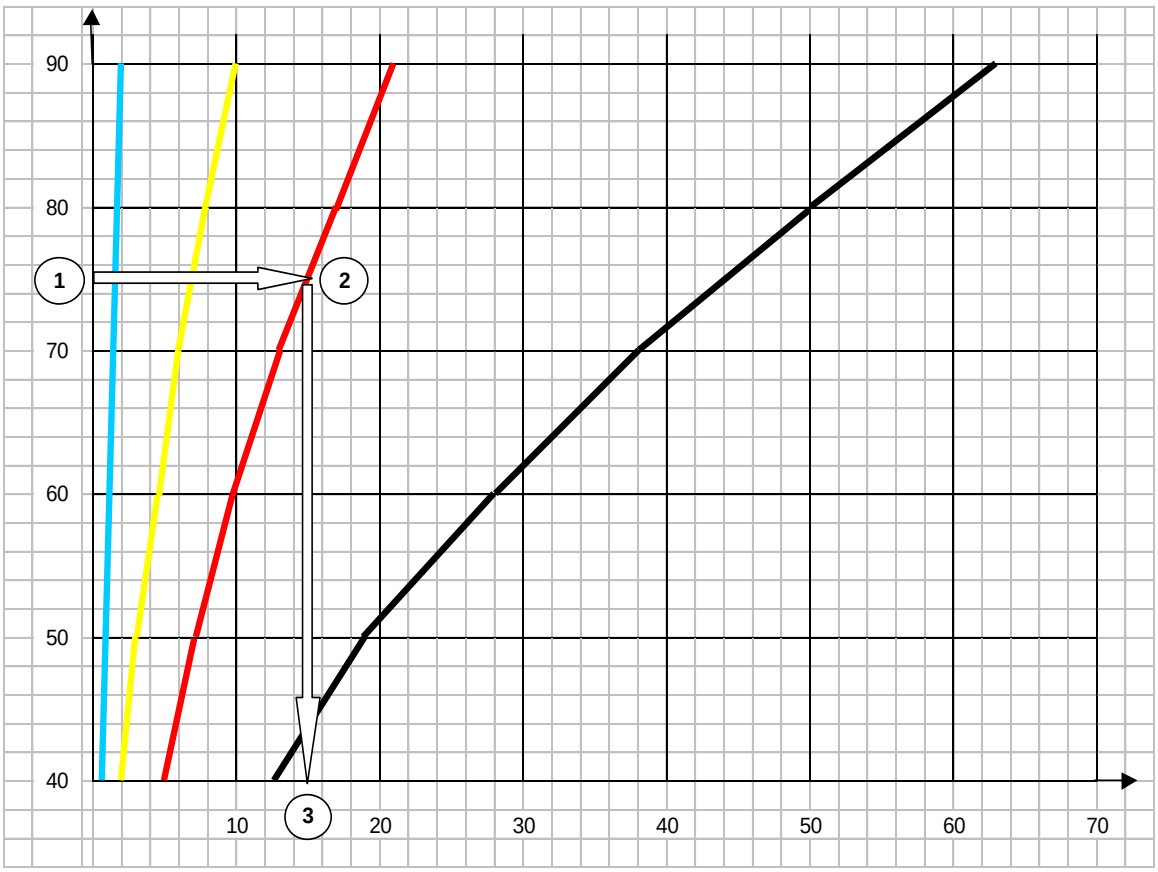
Duty Cycle - ECR1... Built-In Nutrunner

Duty Cycle Benchmarks

Benchmark table to check the allowable duty cycle of a built-in nutrunner from the ECR1 ... Series (without Q-gearbox) during a 2-step tightening process for a bolt with metric profile, without locking device (like Polystop, for example).

Note:
Since the duty cycle is largely dependent upon the operating conditions and work speed, these are reference values only.

Md as % of max. nutrunner capacity



Cycle time (seconds)

Operating Condition Curves:

- hard (ca. 30)
- medium hard (ca. 120)
- medium soft (ca. 1 rotation)
- soft (ca. 3 rotations)

Application Example:
Check the allowable duty cycle

1. Use a nutrunner with a tightening torque based on 75% of the maximum capacity for the selected nutrunner
2. Select the appropriate operating conditions curve
3. Calculate possible cycle time (in this example > 15 sec)

HIGH POWER Built-In Nutrunner

E 1.0.8

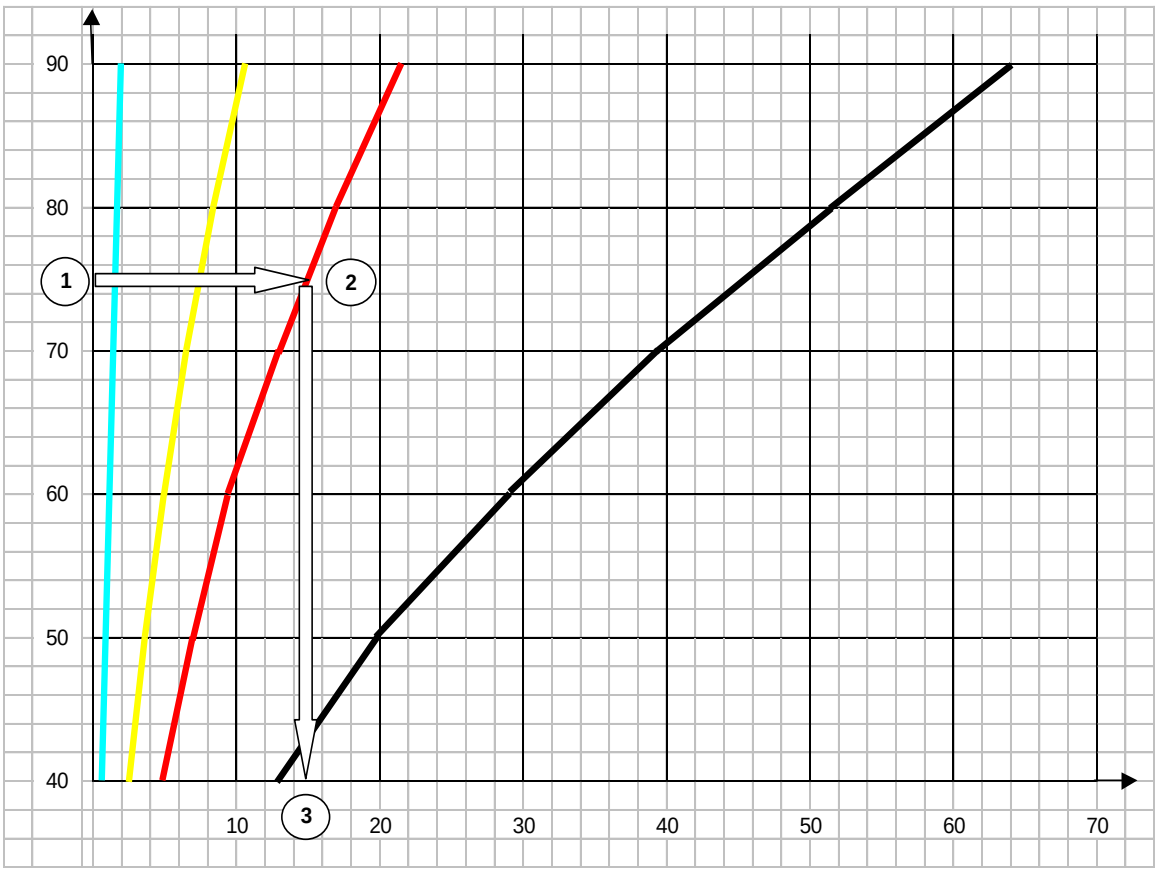
Duty Cycle – ECR2... Built-In Nutrunner

Duty Cycle Benchmarks

Benchmark table to check the allowable duty cycle of a built-in nutrunner from the ECR1 ... Series (without Q-gearbox) during a 2-step tightening process for a bolt with metric profile, without locking device (like Polystop, for example).

Note:
Since the duty cycle is largely dependent upon the operating conditions and work speed, these are reference values only.

Md as % of max. nutrunner capacity



Cycle time (seconds)

Operating Condition Curves:

- hard (ca. 30)
- medium hard (ca. 120)
- medium soft (ca. 1 rotation)
- soft (ca. 3 rotations)

Application Example:
Check the allowable duty cycle

1. Use a nutrunner with a tightening torque based on 75% of the maximum capacity for the selected nutrunner
2. Select the appropriate operating conditions curve
3. Calculate possible cycle time (in this example > 15,5 sec)

HIGH POWER Built-In Nutrunner

E 1.0.8

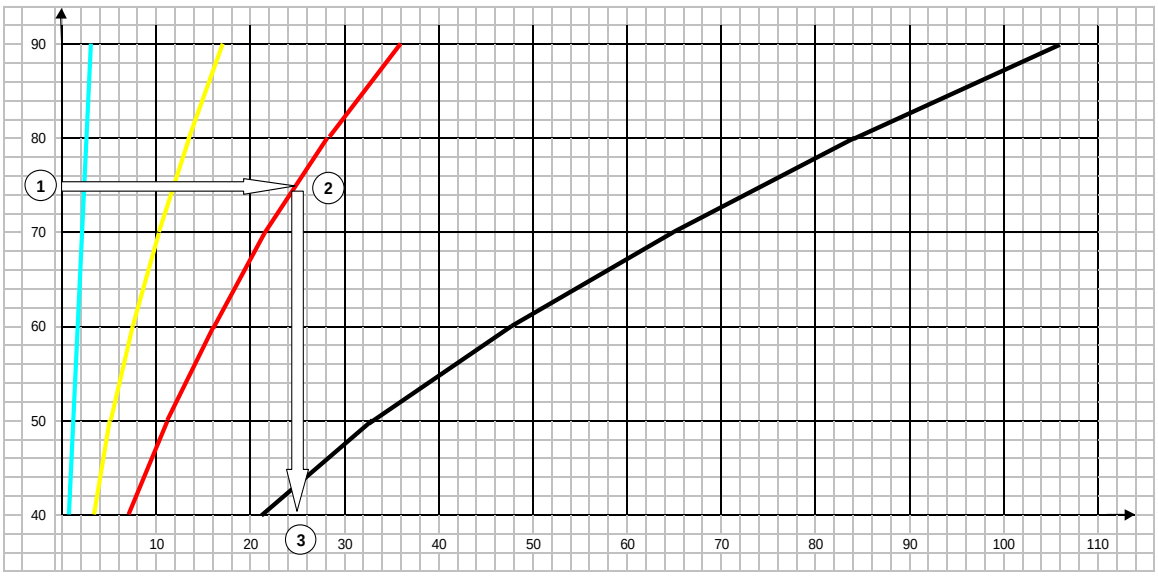
Duty Cycle – ECR3... Built-In Nutrunner

Duty Cycle Benchmarks

Benchmark table to check the allowable duty cycle of a built-in nutrunner from the ECR1 ... Series (without Q-gearbox) during a 2-step tightening process for a bolt with metric profile, without locking device (like Polystop, for example).

Note:
Since the duty cycle is largely dependent upon the operating conditions and work speed, these are reference values only.

Md as % of max. nutrunner capacity



Cycle time (seconds)

Operating Condition Curves:

- hard (ca. 30)
- medium hard (ca. 120)
- medium soft (ca. 1 rotation)
- soft (ca. 3 rotations)

Application Example:
Check the allowable duty cycle

1. Use a nutrunner with a tightening torque based on 75% of the maximum capacity for the selected nutrunner
2. Select the appropriate operating conditions curve
3. Calculate possible cycle time (in this example > 25 sec)

HIGH POWER Built-In Nutrunner

E 1.0.9

Hole Pattern

Built-In Nutrunner Size 1 / Size 2 / Size 3 – Centric Drive

Der Block entspricht den einzelnen Varianten der Einbauschrauber (siehe z.B. Seite 32).

Nutrunner configuration according to block		Hole Pattern (minimum hole pattern with standard drives)				
		2-times [mm]	3-times [mm]	4-times [mm]	5-times [mm]	6-times [mm]
A	Size 1	43	53	62	82	93
	Size 2	59	69	83,5	100	117
	Sz.3/Sz.4	83 / on request	96 / on request	118 / on request	142 / on request	167 / on request
B	Size 1	43	53	62	82	93
	Size 2	59	69	83,5	100	117
	Sz.3/Sz.4	83 / on request	96 / on request	118 / on request	142 / on request	167 / on request
C	Size 1	43	53	62	82	93
	Size 2	59	69	83,5	100	117
	Sz.3/Sz.4	83 / on request	96 / v	118 / on request	142 / on request	167 / on request
D*	Size 1	43	101	120	136	183
	Size 2	59	101	126	145	189
	Sz.3/Sz.4	83 / on request	125 / on request	147 / on request	180 / on request	209 / on request
E	Size 1	43	53	62	82	93
	Size 2	59	69	83,5	100	117
	Sz.3/Sz.4	83 / on request	96 / on request	118 / on request	142 / on request	167 / on request
F	Size 1	43	53	62	82	93
	Size 2	59	101	126	145	189
	Sz.3/Sz.4	83 / on request	96 / on request	118 / on request	142 / on request	167 / on request
G*	Size 1	43	101	120	136	183
	Size 2	59	101	126	145	189
	Sz.3/Sz.4	83 / on request	125 / on request	147 / on request	180 / on request	209 / on request
H*	Size 1	43	101	120	136	183
	Size 2	59	101	126	145	189
	Sz.3/Sz.4	83 / on request	125 / on request	147 / on request	180 / on request	209 / on request
I*	Size 1	43	101	120	136	183
	Size 2	59	101	126	145	189
	Sz.3/Sz.4	83 / on request	125 / on request	147 / on request	180 / on request	209 / on request

*** Hole patten from Configuration A is also possible if using adapter A1 / A2 / A3.**
The bolt length is 100 mm longer as a result.

HIGH POWER Built-In Nutrunner

E 1.0.9

Hole Pattern

Built-In Nutrunner Size 1 / Size 2 – Offset Drive

The block corresponds to the different types of built-in nutrunners (e.g. see page 50).

Nutrunner configuration according to block		Hole Pattern (minimum hole pattern with standard drives)				
		2-times [mm]	3-times [mm]	4-times [mm]	5-times [mm]	6-times [mm]
A	Size 1	31	36	44	53	62
	Size 2	45	52	64	77	90
B	Size 1	31	36	44	53	62
	Size 2	45	52	64	77	90
C	Size 1	31	36	44	53	62
	Size 2	45	52	64	77	90
D	Size 1	31	73	86	108	125
	Size 2	59	80	94	111	126
E	Size 1	31	36	44	53	62
	Size 2	41	48	58	70	82
F	Size 1	31	36	44	53	60
	Size 2	41	48	58	70	82
G	Size 1	31	36	44	53	62
	Size 2	41	48	58	70	82
H	Size 1	31	36	44	53	60
	Size 2	41	48	58	70	82
I	Size 1	31	36	44	53	62
	Size 2	41	48	58	70	82

HIGH POWER Built-In Nutrunner

E 1.0.9

Hole Pattern

Built-In Nutrunner Size 3 – Offset Drive

The block corresponds to the different types of built-in nutrunners (e.g. see page 58).

Nutrunner configuration according to block		Hole Pattern (minimum hole pattern with standard drives)					
		2-times [mm]	3-times [mm]	4-times [mm]	5-times [mm]	6-times [mm]	
A	Size 3	55	64	78	94	110	
B	Size 3	55	64	78	94	110	
C	Size 3	55	64	78	94	110	
D	Size 3	74	92	105	121	136	
E	Size 3	55	64	78	94	110	AOD3...-300 u. AOD3...-450
	Size 3	77	89	109	131	154	AOD3...-800
	Size 3	95	125	134	178	215	AOD3...-1000
F	Size 3	55	64	78	94	110	AOD3...-300 u. AOD3...-450
	Size 3	77	89	109	131	154	AOD3...-800
	Size 3	95	125	134	178	215	AOD3...-1000
G	Size 3	55	64	78	94	110	AOD3...-300 u. AOD3...-450
	Size 3	77	89	109	131	154	AOD3...-800
	Size 3	95	125	134	178	215	AOD3...-1000
H	Size 3	55	64	78	94	110	AOD3...-300 u. AOD3...-450
	Size 3	77	89	109	131	154	AOD3...-800
	Size 3	95	125	134	178	215	AOD3...-1000
I	Size 3	55	64	78	94	110	AOD3...-300 u. AOD3...-450
	Size 3	77	89	109	131	154	AOD3...-800
	Size 3	95	125	134	178	215	AOD3...-1000

HIGH POWER Built-In Nutrunner

E 1.0.9

Hole Pattern

Built-In Nutrunner Size 1 / Size 2 – Angle Drive

The block corresponds to the different types of built-in nutrunners (e.g. see page 70).

Nutrunner configuration according to block		Hole Pattern (minimum hole pattern with standard drives)				
		2-times	3-times	4-times	5-times	6-times
		[mm]	[mm]	[mm]	[mm]	[mm]
A	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
B	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
C	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
D	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
E	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
F	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
G	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
H	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187
I	Size 1	61	82	87	129	141
	Size 2	81	108	115	171	187

HIGH POWER Built-In Nutrunner

E 1.0.9

Hole Pattern

Built-In Nutrunner Size 3 – Angle Drive

The block corresponds to the different types of built-in nutrunners (e.g. see page 78).

Nutrunner configuration according to block		Hole Pattern (minimum hole pattern with standard drives)					
		2-times	3-times	4-times	5-times	6-times	
		[mm]	[mm]	[mm]	[mm]	[mm]	
A	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
B	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
C	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
D	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
E	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
F	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
G	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
H	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission
I	Size 3	101	135	143	213	234	without transmission
	Size 3	140	187	198	295	324	with transmission

Notes

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HIGH POWER Built-In Nutrunner

E 1.1

Built-In Nutrunner – Centric Drive

Torque up to 1200 Nm
Speed up to 1200 rpm

HIGH POWER Built-In Nutrunner

E 1.1

Designation Code Subassemblies

1 Motor and gear units

Design

ECR105

ECR = Built-in tool, brushless driving motor, Resolver
1 = Size 1, 2, 3, 4
05 = Capacity x 10 in Nm

2 Torque sensors

Reaction torque sensor

DR50

D = Torque sensor
R = Reaction torque sensor
50 = Nominal torque of the torque sensor

Reaction torque sensor
with angle encoder

DWR50

D = Torque sensor
W = Angle encoder
R = Reaction torque sensor
50 = Nominal torque of the torque sensor

Action torque sensor

DA50

D = Torque sensor
A = Action torque sensor
50 = Nominal torque of the torque sensor

Action torque sensor
with angle encoder

DWA50

D = Torque sensor
W = Angle encoder
A = Action torque sensor
50 = Nominal torque of the torque sensor

3 Drive units

Centric design
without torque sensor

AZ125

A = Drive
Z = Centric drive
1 = Size 1, 2, 3, 4
25 = Spring travel 25 mm; 50 mm; 80 mm

4 Socket adapter designation

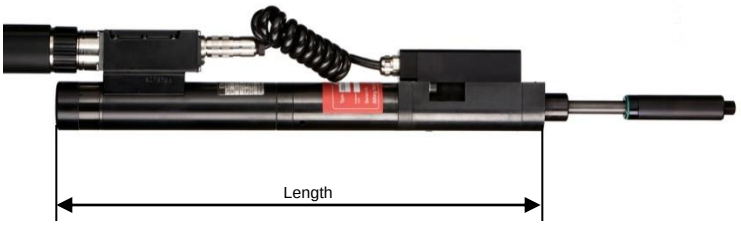
SK1-1/2-50

SK = Socket adapter
1 = Size 1, 2, 3
½ = Size of the square drive in inches
50 = Spring travel 25 mm; 50 mm, 80 mm

Built-In Nutrunner Size 1 – Centric Drive

E 1.1.1

Illustration: ECR105 DA50 AZ150



Size 1

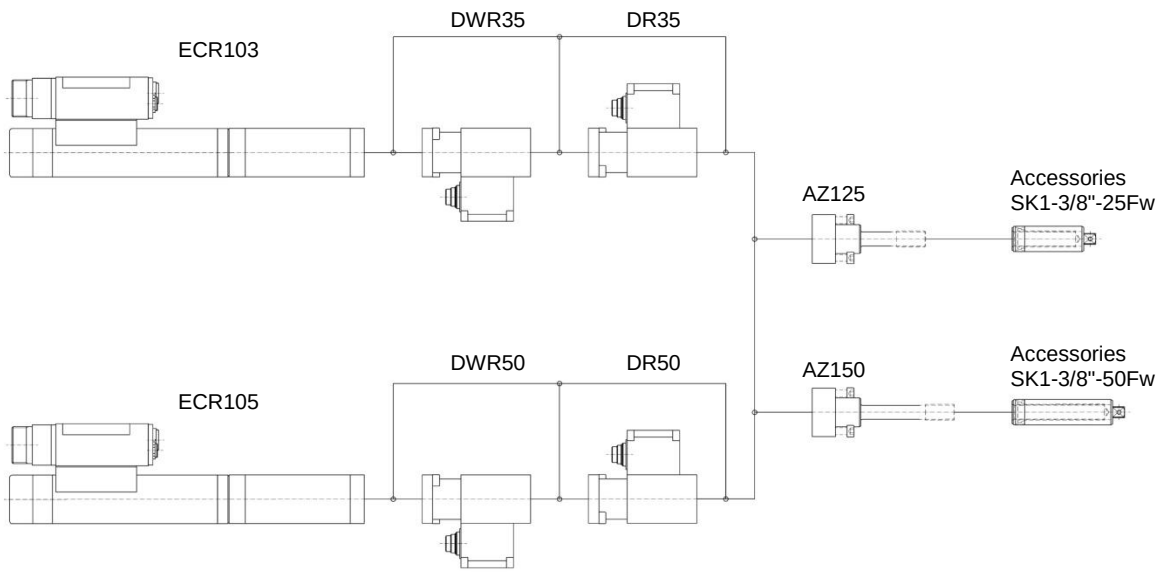
4 Nm up to 51 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	34	11 - 30	ECR103 AZ125	990	327	3,1	67	792 0000
	34	11 - 30	ECR103 AZ150	990	327	3,1	67	792 0001
	51	16 - 45	ECR105 AZ125	661	327	3,1	67	792 0002
	51	16 - 45	ECR105 AZ150	661	327	3,1	67	792 0003
	Built-in nutrunner with reaction torque sensor for calibration							
B	34	11 - 30	ECR103 DWR35 AZ125	990	421	3,5	67	792 0004
	34	11 - 30	ECR103 DWR35 AZ150	990	421	3,5	67	792 0005
	51	16 - 45	ECR105 DWR50 AZ125	661	421	3,5	67	792 0006
	51	16 - 45	ECR105 DWR50 AZ150	661	421	3,5	67	792 0007
	Built-in nutrunner with reaction torque sensor							
C	34	11 - 30	ECR103 DR35 AZ125	990	421	3,4	67	792 0384
	34	11 - 30	ECR103 DR35 AZ150	990	421	3,4	67	792 0385
	51	16 - 45	ECR105 DR50 AZ125	661	421	3,4	67	792 0386
	51	16 - 45	ECR105 DR50 AZ150	661	421	3,4	67	792 0387
	Built-in nutrunner with two reaction torque sensors							
D	34	11 - 30	ECR103 DWR35 DR35 AZ125	990	515	4,9	67	792 0402
	34	11 - 30	ECR103 DWR35 DR35 AZ150	990	515	4,9	67	792 0403
	51	16 - 45	ECR105 DWR50 DR50 AZ125	661	515	4,9	67	792 0404
	51	16 - 45	ECR105 DWR50 DR50 AZ150	661	515	4,9	67	792 0405

Combinations

Design with reaction torque sensor



Note:

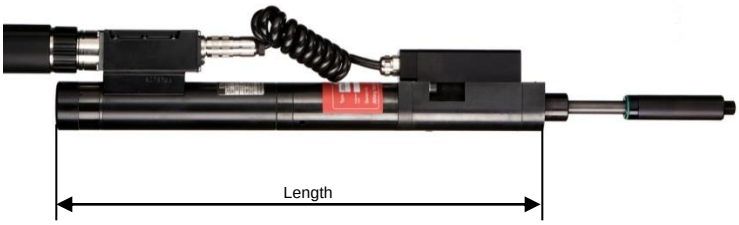
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 1 – Centric Drive

E 1.1.1

Illustration: ECR105 DA50 AZ150



Size 1

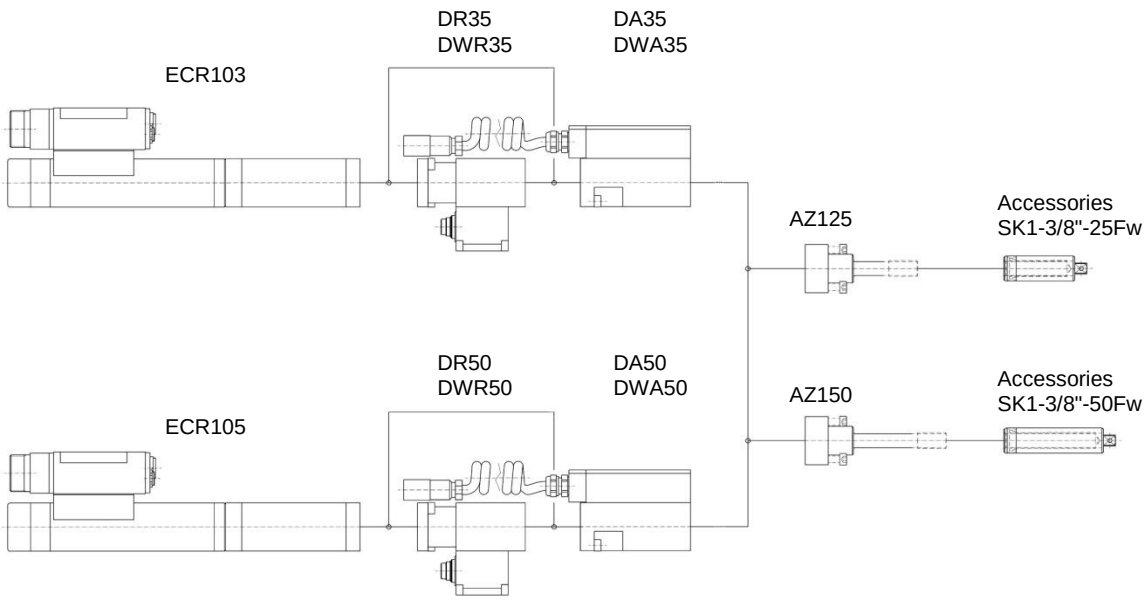
4 Nm up to 51 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	34	4 - 30	ECR103 DA35 AZ125	990	423	4,1	67	792 0012
	34	4 - 30	ECR103 DA35 AZ150	990	423	4,1	67	792 0013
	51	5 - 45	ECR105 DA50 AZ125	661	423	4,1	67	792 0014
	51	5 - 45	ECR105 DA50 AZ150	661	423	4,1	67	792 0015
	Built-in nutrunner with action torque sensor and angle encoder							
F	34	4 - 30	ECR103 DWA35 AZ125	990	423	4,1	67	792 0016
	34	4 - 30	ECR103 DWA35 AZ150	990	423	4,1	67	792 0017
	51	5 - 45	ECR105 DWA50 AZ125	661	423	4,1	67	792 0018
	51	5 - 45	ECR105 DWA50 AZ150	661	423	4,1	67	792 0019
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	34	4 - 30	ECR103 DWR35 DA35 AZ125	990	517	5,0	67	792 0020
	34	4 - 30	ECR103 DWR35 DA35 AZ150	990	517	5,0	67	792 0021
	51	5 - 45	ECR105 DWR50 DA50 AZ125	661	517	5,0	67	792 0022
	51	5 - 45	ECR105 DWR50 DA50 AZ150	661	517	5,0	67	792 0023
	Built-in nutrunner with redundant design							
H	34	4 - 30	ECR103 DR35 DWA35 AZ125	990	517	5,0	67	792 0420
	34	4 - 30	ECR103 DR35 DWA35 AZ150	990	517	5,0	67	792 0421
	51	5 - 45	ECR105 DR50 DWA50 AZ125	661	517	5,0	67	792 0422
	51	5 - 45	ECR105 DR50 DWA50 AZ150	661	517	5,0	67	792 0423
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	34	4 - 30	ECR103 DWR35 DWA35 AZ125	990	517	5,0	67	792 0024
	34	4 - 30	ECR103 DWR35 DWA35 AZ150	990	517	5,0	67	792 0025
	51	5 - 45	ECR105 DWR50 DWA50 AZ125	661	517	5,0	67	792 0026
	51	5 - 45	ECR105 DWR50 DWA50 AZ150	661	517	5,0	67	792 0027

Combinations

Design with action torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

The combination of reaction torque sensor DR and action torque sensor DA is not available.

Built-In Nutrunner Size 2 – Centric Drive

E 1.1.2

Illustration similar (ECR105 DA50 AZ150)

Size 2

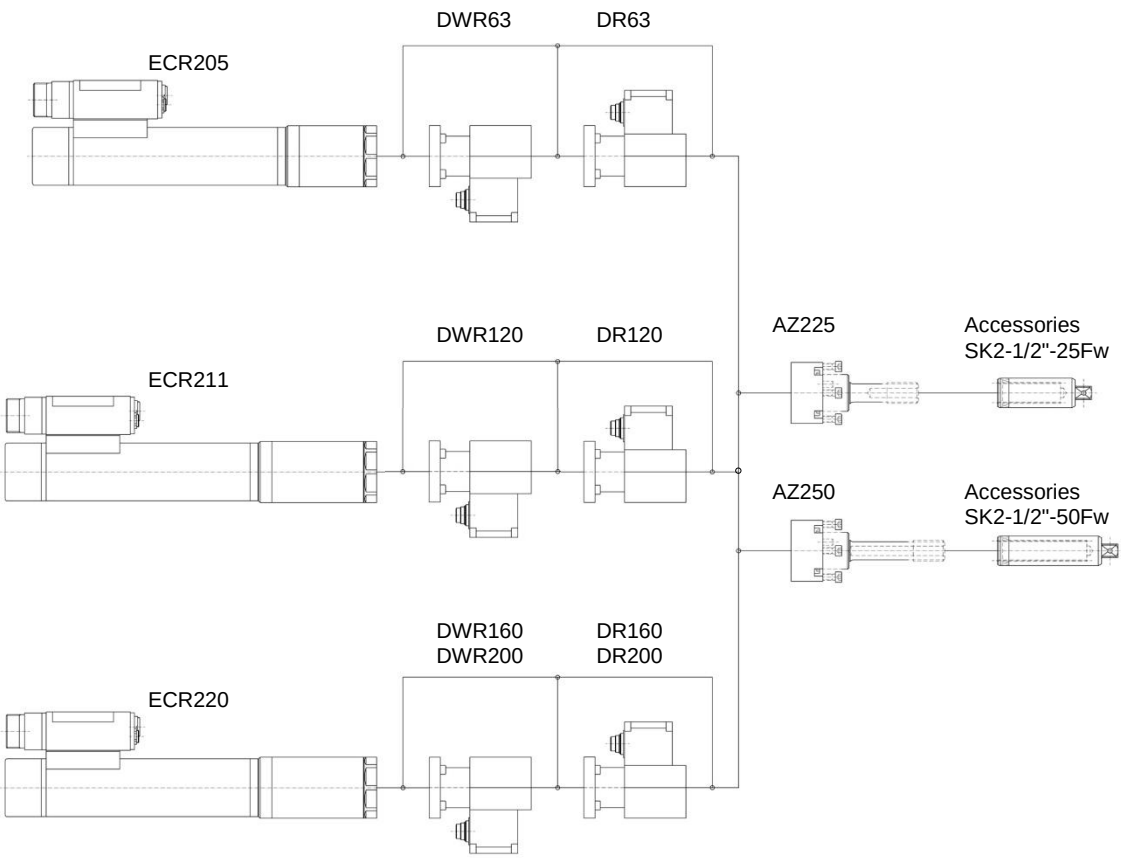
6 Nm up to 207 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	55	17 - 49	ECR205 AZ225	1200	357	5,1	67	792 0028
	55	17 - 49	ECR205 AZ250	1200	357	5,2	67	792 0029
	114	35 - 102	ECR211 AZ225	577	383	5,6	67	792 0030
	114	35 - 102	ECR211 AZ250	577	383	5,7	67	792 0031
	207	63 - 186	ECR220 AZ225	319	383	5,6	67	792 0032
	207	63 - 186	ECR220 AZ250	319	383	5,7	67	792 0033
	Built-in nutrunner with reaction torque sensor for calibration							
B	55	17 - 49	ECR205 DWR63 AZ225	1200	454	6,6	67	792 0034
	55	17 - 49	ECR205 DWR63 AZ250	1200	454	6,7	67	792 0035
	114	35 - 102	ECR211 DWR120 AZ225	577	480	7,1	67	792 0036
	114	35 - 102	ECR211 DWR120 AZ250	577	480	7,2	67	792 0037
	207	63 - 186	ECR220 DWR200 AZ225	319	480	7,1	67	792 0040
	207	63 - 186	ECR220 DWR200 AZ250	319	480	7,2	67	792 0041
	Built-in nutrunner with reaction torque sensor							
C	55	9 - 49	ECR205 DR63 AZ225	1200	454	6,5	67	792 0388
	55	9 - 49	ECR205 DR63 AZ250	1200	454	6,6	67	792 0389
	114	18 - 102	ECR211 DR120 AZ225	577	480	7,0	67	792 0390
	114	18 - 102	ECR211 DR120 AZ250	577	480	7,1	67	792 0391
	207	24 - 144	ECR220 DR160 AZ225	319	480	7,0	67	792 0392
	207	24 - 144	ECR220 DR160 AZ250	319	480	7,1	67	792 0393
	207	30 - 180	ECR220 DR200 AZ225	319	480	7,0	67	792 0394
	207	30 - 180	ECR220 DR200 AZ250	319	480	7,1	67	792 0395
	Built-in nutrunner with two reaction torque sensors							
D	55	9 - 49	ECR205 DWR63 DR63 AZ225	1200	551	7,9	67	792 0406
	55	9 - 49	ECR205 DWR63 DR63 AZ250	1200	551	8,0	67	792 0407
	114	18 - 102	ECR211 DWR120 DR120 AZ225	577	577	8,4	67	792 0408
	114	18 - 102	ECR211 DWR120 DR120 AZ250	577	577	8,5	67	792 0409
	207	24 - 144	ECR220 DWR160 DR160 AZ225	319	577	8,4	67	792 0410
	207	24 - 144	ECR220 DWR160 DR160 AZ250	319	577	8,5	67	792 0411
	207	30 - 180	ECR220 DWR200 DR200 AZ225	319	577	8,4	67	792 0412
	207	30 - 180	ECR220 DWR200 DR200 AZ250	319	577	8,5	67	792 0413

Combinations

Design with reaction torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 2 – Centric Drive

E 1.1.2

Illustration similar (ECR105 DA50 AZ150)

Size 2

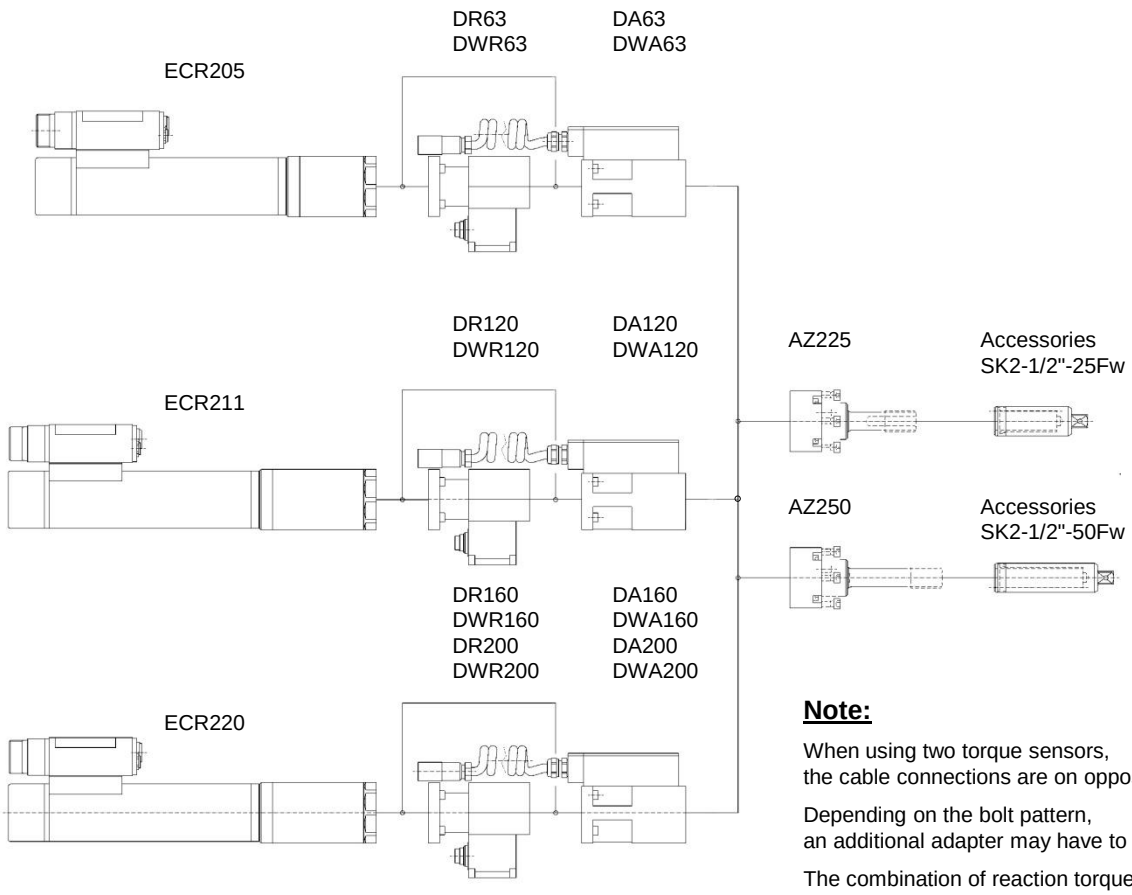
6 Nm up to 207 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	55	6 - 49	ECR205 DA63 AZ225	1200	457	6,7	67	792 0050
	55	6 - 49	ECR205 DA63 AZ250	1200	457	6,8	67	792 0051
	114	12 - 102	ECR211 DA120 AZ225	577	483	7,2	67	792 0052
	114	12 - 102	ECR211 DA120 AZ250	577	483	7,3	67	792 0053
	207	16 - 144	ECR220 DA160 AZ225	319	483	7,2	67	792 0054
	207	16 - 144	ECR220 DA160 AZ250	319	483	7,3	67	792 0055
	207	20 - 180	ECR220 DA200 AZ225	319	483	7,2	67	792 0056
	207	20 - 180	ECR220 DA200 AZ250	319	483	7,3	67	792 0057
	Built-in nutrunner with action torque sensor and angle encoder							
F	55	6 - 49	ECR205 DWA63 AZ225	1200	457	6,7	67	792 0058
	55	6 - 49	ECR205 DWA63 AZ250	1200	457	6,8	67	792 0059
	114	12 - 102	ECR211 DWA120 AZ225	577	483	7,2	67	792 0060
	114	12 - 102	ECR211 DWA120 AZ250	577	483	7,3	67	792 0061
	207	20 - 180	ECR220 DWA200 AZ225	319	483	7,2	67	792 0062
	207	20 - 180	ECR220 DWA200 AZ250	319	483	7,3	67	792 0063
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	55	6 - 49	ECR205 DWR63 DA63 AZ225	1200	554	8,0	67	792 0064
	55	6 - 49	ECR205 DWR63 DA63 AZ250	1200	554	8,1	67	792 0065
	114	12 - 102	ECR211 DWR120 DA120 AZ225	577	580	8,5	67	792 0066
	114	12 - 102	ECR211 DWR120 DA120 AZ250	577	580	8,6	67	792 0067
	207	16 - 144	ECR220 DWR160 DA160 AZ225	319	580	8,5	67	792 0068
	207	16 - 144	ECR220 DWR160 DA160 AZ250	319	580	8,6	67	792 0069
	207	20 - 180	ECR220 DWR200 DA200 AZ225	319	580	8,5	67	792 0070
	207	20 - 180	ECR220 DWR200 DA200 AZ250	319	580	8,6	67	792 0071
	Built-in nutrunner with redundant design							
H	55	6 - 49	ECR205 DR63 DWA63 AZ225	1200	554	8,0	67	792 0424
	55	6 - 49	ECR205 DR63 DWA63 AZ250	1200	554	8,1	67	792 0425
	114	12 - 102	ECR211 DR120 DWA120 AZ225	577	580	8,5	67	792 0426
	114	12 - 102	ECR211 DR120 DWA120 AZ250	577	580	8,6	67	792 0427
	207	20 - 180	ECR220 DR200 DWA200 AZ225	319	580	8,5	67	792 0430
	207	20 - 180	ECR220 DR200 DWA200 AZ250	319	580	8,6	67	792 0431
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	55	6 - 49	ECR205 DWR63 DWA63 AZ225	1200	554	8,0	67	792 0072
	55	6 - 49	ECR205 DWR63 DWA63 AZ250	1200	554	8,1	67	792 0073
	114	12 - 102	ECR211 DWR120 DWA120 AZ225	577	580	8,5	67	792 0074
	114	12 - 102	ECR211 DWR120 DWA120 AZ250	577	580	8,6	67	792 0075
	207	20 - 180	ECR220 DWR200 DWA200 AZ225	319	580	8,5	67	792 0076
	207	20 - 180	ECR220 DWR200 DWA200 AZ250	319	580	8,6	67	792 0077

Combinations

Design with action torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

The combination of reaction torque sensor DR
and action torque sensor DA is not available.

Built-In Nutrunner Size 3 – Centric Drive

E 1.1.3

Illustration similar (ECR105 DA50 AZ150)

Size 3

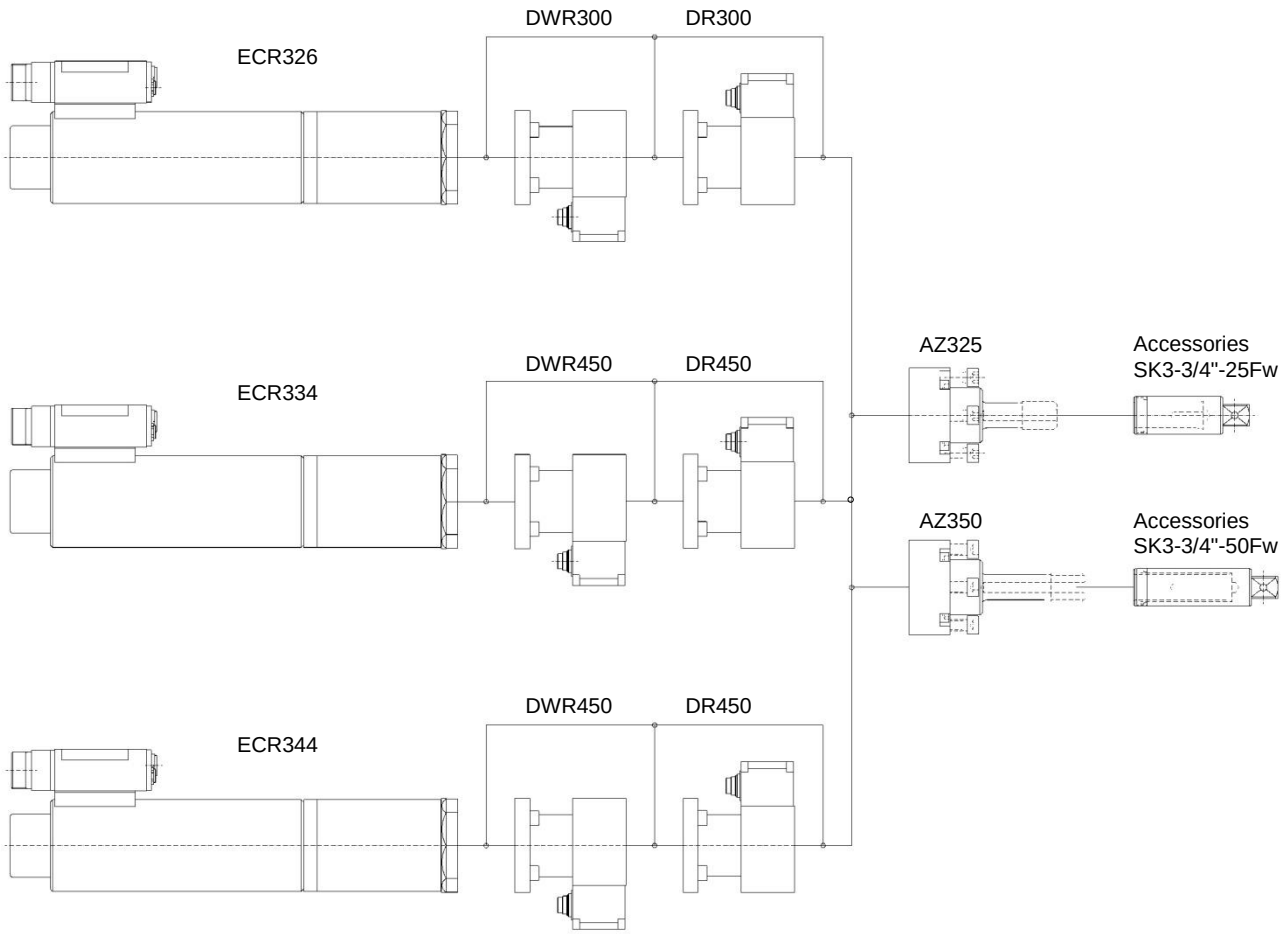
27 Nm up to 439 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	261	79 - 234	ECR326 AZ325	470	426	8,6	65	792 0078
	261	79 - 234	ECR326 AZ350	470	426	8,7	65	792 0079
	338	102 - 304	ECR334 AZ325	362	426	11,8	65	792 0080
	338	102 - 304	ECR334 AZ350	362	426	11,9	65	792 0081
	439	132 - 395	ECR344 AZ325	280	426	11,8	65	792 0082
	439	132 - 395	ECR344 AZ350	280	426	11,9	65	792 0083
	Built-in nutrunner with reaction torque sensor for calibration							
B	261	79 - 234	ECR326 DWR300 AZ325	470	523	11,3	65	792 0084
	261	79 - 234	ECR326 DWR300 AZ350	470	523	11,4	65	792 0085
	338	102 - 304	ECR334 DWR450 AZ325	362	523	14,6	65	792 0086
	338	102 - 304	ECR334 DWR450 AZ350	362	523	14,7	65	792 0087
	439	132 - 395	ECR344 DWR450 AZ325	280	523	14,6	65	792 0088
	439	132 - 395	ECR344 DWR450 AZ350	280	523	14,7	65	792 0089
	Built-in nutrunner with reaction torque sensor							
C	261	40 - 234	ECR326 DR300 AZ325	470	523	11,2	65	792 0396
	261	40 - 234	ECR326 DR300 AZ350	470	523	11,3	65	792 0397
	338	51 - 304	ECR334 DR450 AZ325	362	523	14,5	65	792 0398
	338	51 - 304	ECR334 DR450 AZ350	362	523	14,6	65	792 0399
	439	66 - 395	ECR344 DR450 AZ325	280	523	14,5	65	792 0400
	439	66 - 395	ECR344 DR450 AZ350	280	523	14,6	65	792 0401
	Built-in nutrunner with two reaction torque sensors							
D	261	40 - 234	ECR326 DWR300 DR300 AZ325	470	620	13,8	65	792 0414
	261	40 - 234	ECR326 DWR300 DR300 AZ350	470	620	13,9	65	792 0415
	338	51 - 304	ECR334 DWR450 DR450 AZ325	362	620	17,1	65	792 0416
	338	51 - 304	ECR334 DWR450 DR450 AZ350	362	620	17,2	65	792 0417
	439	66 - 395	ECR344 DWR450 DR450 AZ325	280	620	17,1	65	792 0418
	439	66 - 395	ECR344 DWR450 DR450 AZ350	280	620	17,2	65	792 0419

Combinations

Design with reaction torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 3 – Centric Drive

E 1.1.3

Illustration similar (ECR105 DA50 AZ150)

Size 3

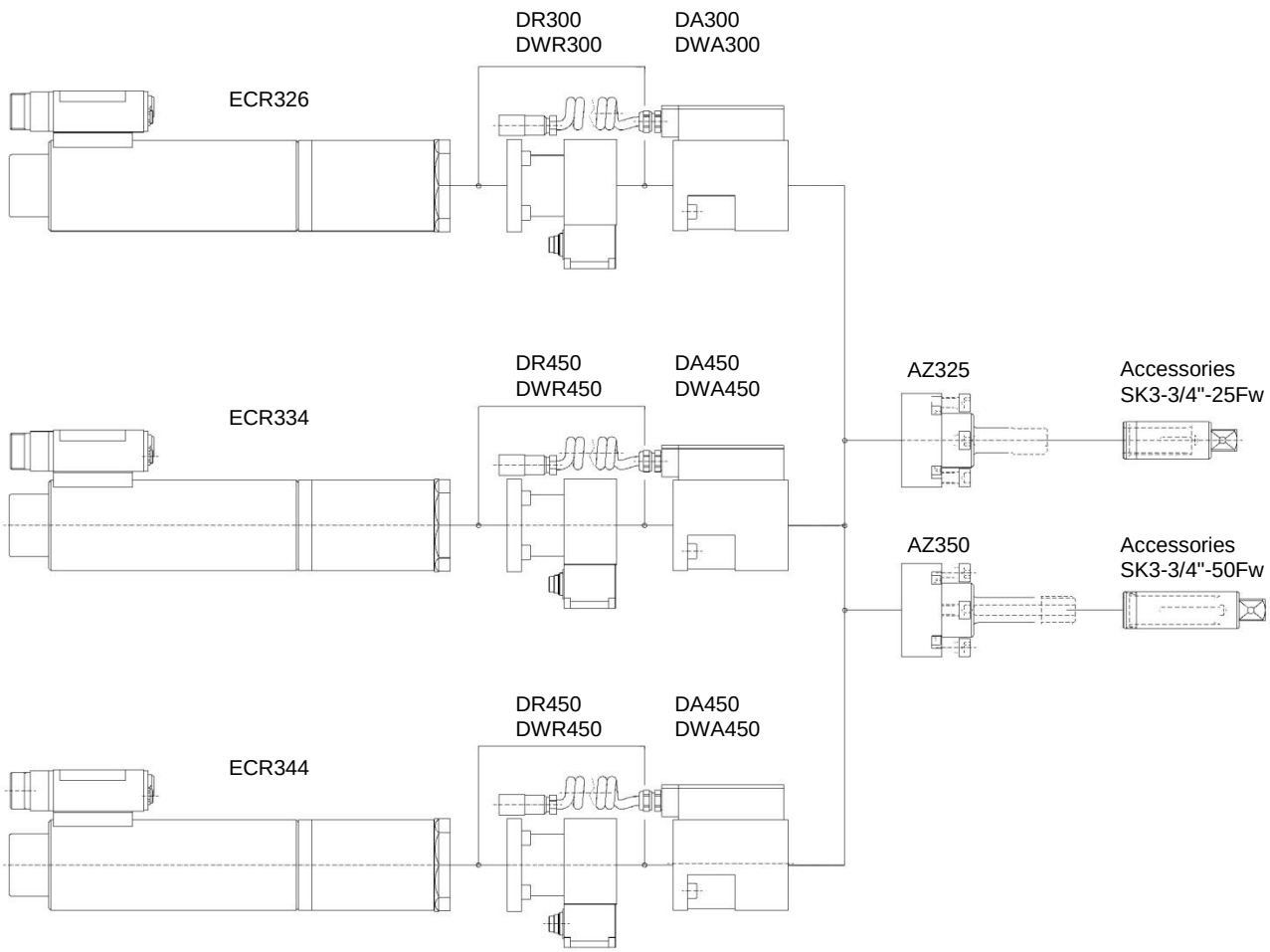
27 Nm up to 439 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	261	27 - 234	ECR326 DA300 AZ325	470	528	13,1	65	792 0096
	261	27 - 234	ECR326 DA300 AZ350	470	528	13,2	65	792 0097
	338	34 - 304	ECR334 DA450 AZ325	362	528	16,3	65	792 0098
	338	34 - 304	ECR334 DA450 AZ350	362	528	16,4	65	792 0099
	439	44 - 395	ECR344 DA450 AZ325	280	528	16,3	65	792 0100
	439	44 - 395	ECR344 DA450 AZ350	280	528	16,4	65	792 0101
	Built-in nutrunner with action torque sensor and angle encoder							
F	261	27 - 234	ECR326 DWA300 AZ325	470	528	13,1	65	792 0102
	261	27 - 234	ECR326 DWA300 AZ350	470	528	13,2	65	792 0103
	338	34 - 304	ECR334 DWA450 AZ325	362	528	16,3	65	792 0104
	338	34 - 304	ECR334 DWA450 AZ350	362	528	16,4	65	792 0105
	439	44 - 395	ECR344 DWA450 AZ325	280	528	16,3	65	792 0106
	439	44 - 395	ECR344 DWA450 AZ350	280	528	16,4	65	792 0107
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	261	27 - 234	ECR326 DWR300 DA300 AZ325	470	625	15,7	65	792 0108
	261	27 - 234	ECR326 DWR300 DA300 AZ350	470	625	15,8	65	792 0109
	338	34 - 304	ECR334 DWR450 DA450 AZ325	362	625	19,0	65	792 0110
	338	34 - 304	ECR334 DWR450 DA450 AZ350	362	625	19,1	65	792 0111
	439	44 - 395	ECR344 DWR450 DA450 AZ325	280	625	19,0	65	792 0112
	439	44 - 395	ECR344 DWR450 DA450 AZ350	280	625	19,1	65	792 0113
	Built-in nutrunner with redundant design							
H	261	27 - 234	ECR326 DR300 DWA300 AZ325	470	625	15,7	65	792 0432
	261	27 - 234	ECR326 DR300 DWA300 AZ350	470	625	15,8	65	792 0433
	338	34 - 304	ECR334 DR450 DWA450 AZ325	362	625	19,0	65	792 0434
	338	34 - 304	ECR334 DR450 DWA450 AZ350	362	625	19,1	65	792 0435
	439	44 - 395	ECR344 DR450 DWA450 AZ325	280	625	19,0	65	792 0436
	439	44 - 395	ECR344 DR450 DWA450 AZ350	280	625	19,1	65	792 0437
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	261	27 - 234	ECR326 DWR300 DWA300 AZ325	470	625	15,7	65	792 0114
	261	27 - 234	ECR326 DWR300 DWA300 AZ350	470	625	15,8	65	792 0115
	338	34 - 304	ECR334 DWR450 DWA450 AZ325	362	625	19,0	65	792 0116
	338	34 - 304	ECR334 DWR450 DWA450 AZ350	362	625	19,1	65	792 0117
	439	44 - 395	ECR344 DWR450 DWA450 AZ325	280	625	19,0	65	792 0118
	439	44 - 395	ECR344 DWR450 DWA450 AZ350	280	625	19,1	65	792 0119

Combinations

Design with action torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

The combination of reaction torque sensor DR and action torque sensor DA is not available.

Built-In Nutrunner Size 3 – Centric Drive

E 1.1.4

Illustration similar (ECR105 DA50 AZ150)

Size 4

120 Nm up to 1200 Nm

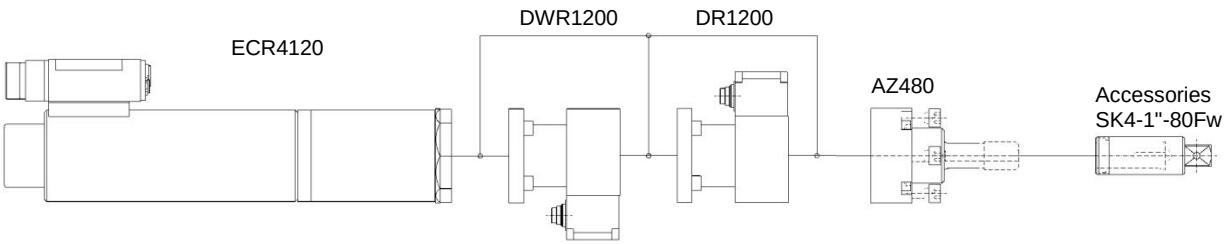
Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	1200	359 - 1076	ECR4120AZ480	100	525	22,9	65	792 0702
	Built-in nutrunner with reaction torque sensor for calibration							
B	1200	359 - 1076	ECR4120DWR1200AZ480	100	654	28,1	65	792 0703
	Built-in nutrunner with reaction torque sensor							
C	1200	180 - 1076	ECR4120DR1200AZ480	100	654	28,1	65	792 0704
	Built-in nutrunner with two reaction torque sensor							
D	1200	180 - 1076	ECR4120DWR1200DR1200AZ480	100	783	33,3	65	792 0705

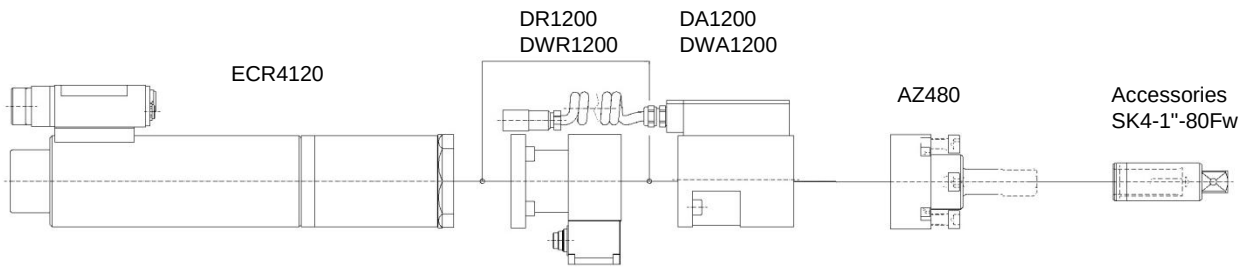
	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	1200	120 - 1076	ECR4120DA1200AZ480	100	672	29,2	65	792 0706
	Built-in nutrunner with action torque sensor and angle encoder							
F	1200	120 - 1076	ECR4120DWA1200AZ480	100	672	29,2	65	792 0707
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	1200	120 - 1076	ECR4120DWR1200DA1200AZ480	100	801	34,4	65	792 0708
	Built-in nutrunner with redundant design							
H	1200	120 - 1076	ECR4120DR1200DWA1200AZ480	100	801	34,4	65	792 0709
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	1200	120 - 1076	ECR4120DWR1200DWA1200AZ480	100	801	34,4	65	792 0710

Combinations

Design with reaction torque sensor



Design with action torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Notes

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HIGH POWER Built-In Nutrunner

E 1.2

Built-In Nutrunner – Offset Drive

Torque up to 1075 Nm
Speed up to 1120 rpm

HIGH POWER Built-In Nutrunner

E 1.2

Designation Code Subassemblies

1 Motor and gear units

Design

ECR105

ECR = Built-in tool, brushless driving motor, Resolver
1 = Size 1, 2, 3
05 = Capacity x 10 in Nm

2 Torque sensors

Reaction torque sensor

DR50

D = Torque sensor
R = Reaction torque sensor
50 = Nominal torque of the torque sensor

Reaction torque sensor
with angle encoder

DWR50

D = Torque sensor
W = Angle encoder
R = Reaction torque sensor
50 = Nominal torque of the torque sensor

3 Drive units

Offset design
without torque sensor

AO125

A = Drive
O = Offset drive
1 = Size 1, 2, 3
25 = Spring travel 25mm; 50mm

Offset design
with action torque sensor

AOD125-50

A = Drive
O = Offset drive
D = Action torque sensor
1 = Size 1, 2, 3
25 = Spring travel 25mm; 50mm
50 = Nominal torque of the torque sensor

Angle encoder subassembly
for offet drive AOD

W1

W = Angle encoder subassembly
1 = Size 1, 2, 3

4 Socket adapter designation

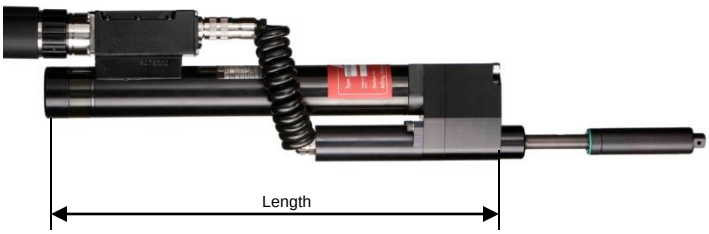
SK1-1/2-50

SK = Socket adapter
1 = Size 1, 2, 3
½ = Size of the square drive in inches
50 = Spring travel 25mm; 50mm

Built-In Nutrunner Size 1 – Offset Drive

E 1.2.1

Illustration: ECR105 AOD150-50



Size 1

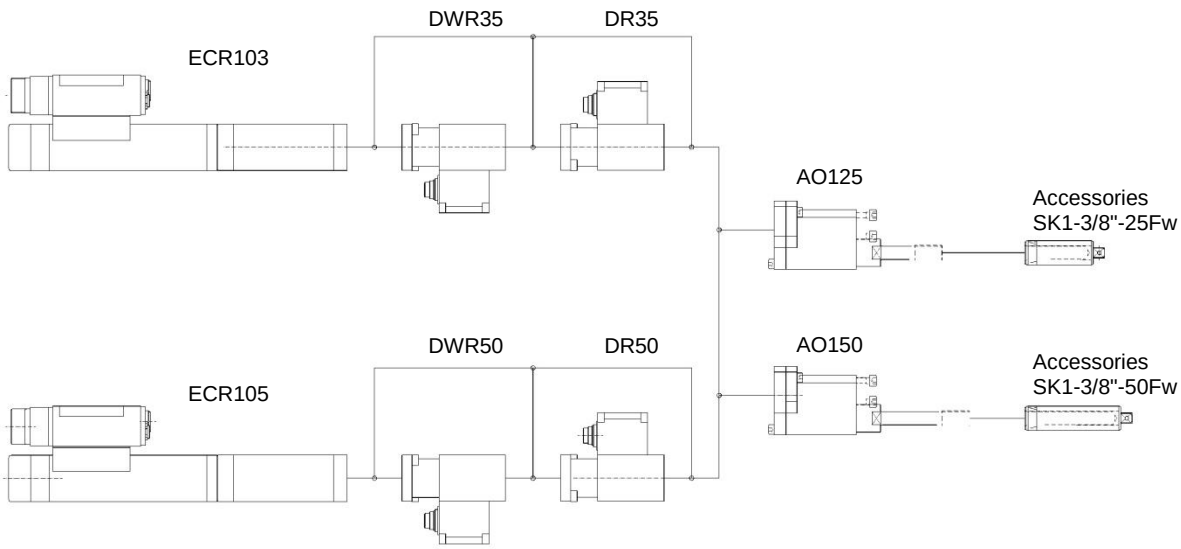
4 Nm up to 51 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with reaction torque sensor							
A	34	12 - 30	ECR103 AO125	927	382	3,2	67	792 0120
	34	12 - 30	ECR103 AO150	927	382	3,3	67	792 0121
	51	18 - 45	ECR105 AO125	619	382	3,2	67	792 0122
	51	18 - 45	ECR105 AO150	619	382	3,3	67	792 0123
	Built-in nutrunner with reaction torque sensor for calibration							
B	34	12 - 30	ECR103 DWR35 AO125	927	476	4,2	67	792 0124
	34	12 - 30	ECR103 DWR35 AO150	927	476	4,2	67	792 0125
	51	18 - 45	ECR105 DWR50 AO125	619	476	4,2	67	792 0126
	51	18 - 45	ECR105 DWR50 AO150	619	476	4,2	67	792 0127
	Built-in nutrunner with reaction torque sensor							
C	34	7 - 30	ECR103 DR35 AO125	927	476	4,1	67	792 0438
	34	7 - 30	ECR103 DR35 AO150	927	476	4,1	67	792 0439
	51	10 - 45	ECR105 DR50 AO125	619	476	4,1	67	792 0440
	51	10 - 45	ECR105 DR50 AO150	619	476	4,1	67	792 0441
	Built-in nutrunner with two reaction torque sensors							
D	34	7 - 30	ECR103 DWR35 DR35 AO125	927	570	5,0	67	792 0456
	34	7 - 30	ECR103 DWR35 DR35 AO150	927	570	5,0	67	792 0457
	51	10 - 45	ECR105 DWR50 DR50 AO125	619	570	5,0	67	792 0458
	51	10 - 45	ECR105 DWR50 DR50 AO150	619	570	5,0	67	792 0459

Combinations

Design with reaction torque sensor



Note:

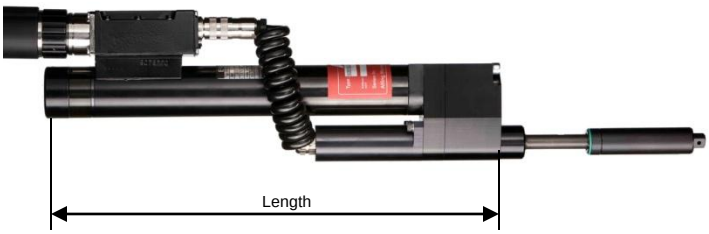
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 1 – Offset Drive

E 1.2.1

Illustration: ECR105 AOD150-50



Size 1

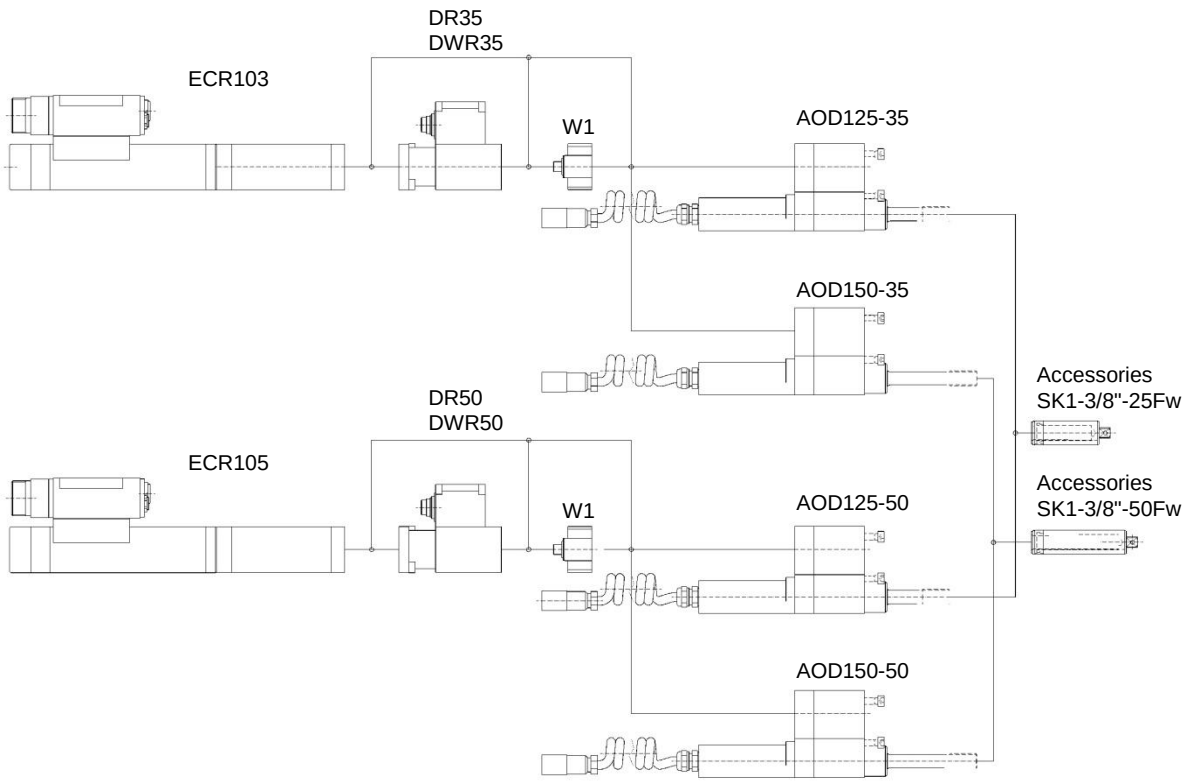
4 Nm up to 51 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	34	4 - 30	ECR103 AOD125-35	927	371	3,6	67	792 0132
	34	4 - 30	ECR103 AOD150-35	927	371	3,6	67	792 0133
	51	5 - 45	ECR105 AOD125-50	619	371	3,6	67	792 0134
	51	5 - 45	ECR105 AOD150-50	619	371	3,6	67	792 0135
	Built-in nutrunner with action torque sensor and angle encoder							
F	34	4 - 30	ECR103 W1 AOD125-35	927	393	3,7	67	792 0136
	34	4 - 30	ECR103 W1 AOD150-35	927	393	3,7	67	792 0137
	51	5 - 45	ECR105 W1 AOD125-50	619	393	3,7	67	792 0138
	51	5 - 45	ECR105 W1 AOD150-50	619	393	3,7	67	792 0139
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	34	4 - 30	ECR103 DWR35 AOD125-35	927	465	4,6	67	792 0140
	34	4 - 30	ECR103 DWR35 AOD150-35	927	465	4,6	67	792 0141
	51	5 - 45	ECR105 DWR50 AOD125-50	619	465	4,6	67	792 0142
	51	5 - 45	ECR105 DWR50 AOD150-50	619	465	4,6	67	792 0143
	Built-in nutrunner with redundant design							
H	34	4 - 30	ECR103 DR35 W1 AOD125-35	927	487	4,7	67	792 0474
	34	4 - 30	ECR103 DR35 W1 AOD150-35	927	487	4,7	67	792 0475
	51	5 - 45	ECR105 DR50 W1 AOD125-50	619	487	4,7	67	792 0476
	51	5 - 45	ECR105 DR50 W1 AOD150-50	619	487	4,7	67	792 0477
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	34	4 - 30	ECR103 DWR35 W1 AOD125-35	927	487	4,7	67	792 0144
	34	4 - 30	ECR103 DWR35 W1 AOD150-35	927	487	4,7	67	792 0145
	51	5 - 45	ECR105 DWR50 W1 AOD125-50	619	487	4,7	67	792 0146
	51	5 - 45	ECR105 DWR50 W1 AOD150-50	619	487	4,7	67	792 0147

Combinations

Design with action torque sensor



Note:

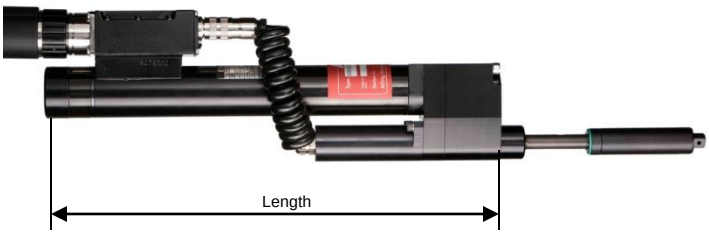
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 2 – Offset Drive

E 1.2.2

Illustration similar (ECR105 AOD150-50)



Size 2

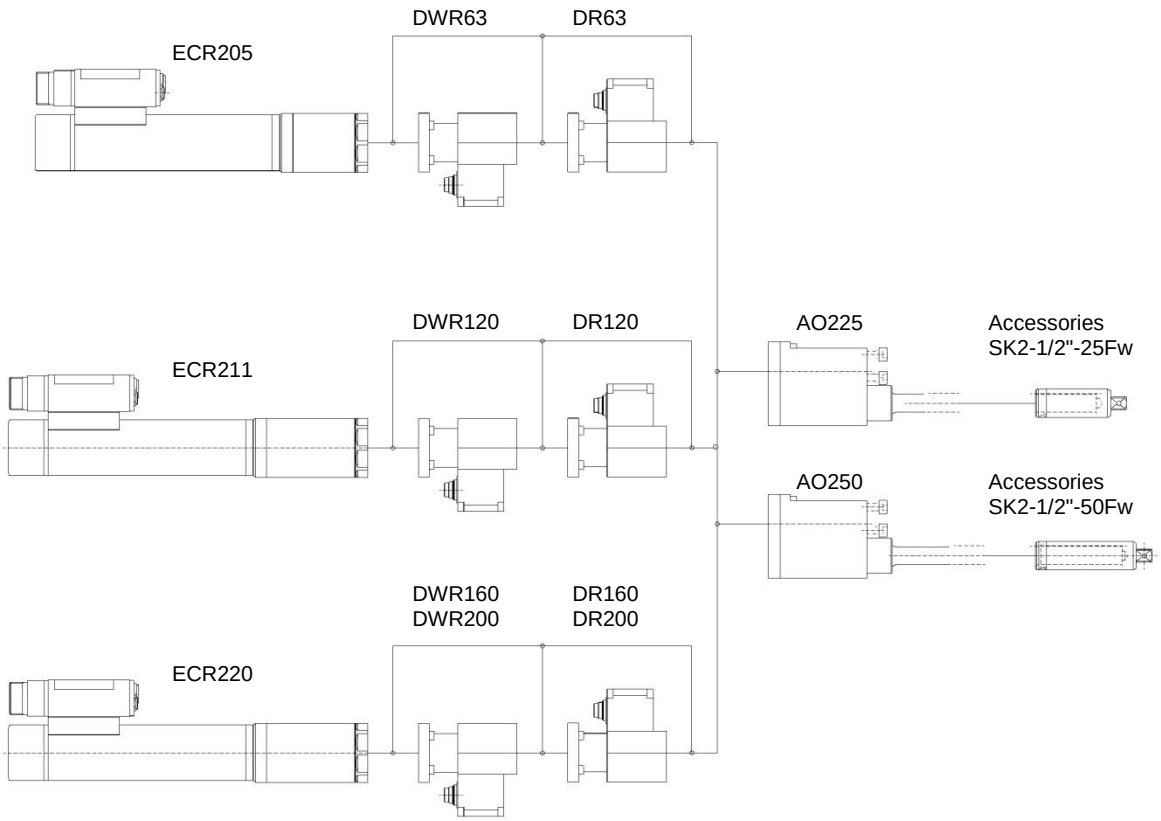
6 Nm up to 210 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	55	20 - 49	ECR205 AO225	1120	424	6,1	67	792 0148
	55	20 - 49	ECR205 AO250	1120	424	6,2	67	792 0149
	115	41 - 103	ECR211 AO225	538	450	6,6	67	792 0150
	115	41 - 103	ECR211 AO250	538	450	6,7	67	792 0151
	210	74 - 189	ECR220 AO225	297	450	6,6	67	792 0152
	210	74 - 189	ECR220 AO250	297	450	6,7	67	792 0153
	Built-in nutrunner with reaction torque sensor for calibration							
B	55	20 - 49	ECR205 DWR63 AO225	1120	521	7,6	67	792 0154
	55	20 - 49	ECR205 DWR63 AO250	1120	521	7,7	67	792 0155
	115	41 - 103	ECR211 DWR120 AO225	538	547	8,1	67	792 0156
	115	41 - 103	ECR211 DWR120 AO250	538	547	8,2	67	792 0157
	210	74 - 189	ECR220 DWR200 AO225	297	547	8,1	67	792 0160
	210	74 - 189	ECR220 DWR200 AO250	297	547	8,2	67	792 0161
	Built-in nutrunner with reaction torque sensor							
C	55	11 - 49	ECR205 DR63 AO225	1120	521	7,5	67	792 0442
	55	11 - 49	ECR205 DR63 AO250	1120	521	7,6	67	792 0443
	115	23 - 103	ECR211 DR120 AO225	538	547	8,0	67	792 0444
	115	23 - 103	ECR211 DR120 AO250	538	547	8,1	67	792 0445
	210	33 - 145	ECR220 DR160 AO225	297	547	8,0	67	792 0446
	210	33 - 145	ECR220 DR160 AO250	297	547	8,1	67	792 0447
	210	41 - 182	ECR220 DR200 AO225	297	547	8,0	67	792 0448
	210	41 - 182	ECR220 DR200 AO250	297	547	8,1	67	792 0449
	Built-in nutrunner with two reaction torque sensors							
D	55	11 - 49	ECR205 DWR63 DR63 AO225	1120	618	8,8	67	792 0460
	55	11 - 49	ECR205 DWR63 DR63 AO250	1120	618	8,9	67	792 0461
	115	23 - 103	ECR211 DWR120 DR120 AO225	538	644	9,3	67	792 0462
	115	23 - 103	ECR211 DWR120 DR120 AO250	538	644	9,4	67	792 0463
	210	33 - 145	ECR220 DWR160 DR160 AO225	297	644	9,3	67	792 0464
	210	33 - 145	ECR220 DWR160 DR160 AO250	297	644	9,4	67	792 0465
	210	41 - 182	ECR220 DWR200 DR200 AO225	297	644	9,3	67	792 0466
	210	41 - 182	ECR220 DWR200 DR200 AO250	297	644	9,4	67	792 0467

Combinations

Design with reaction torque sensor



Note:

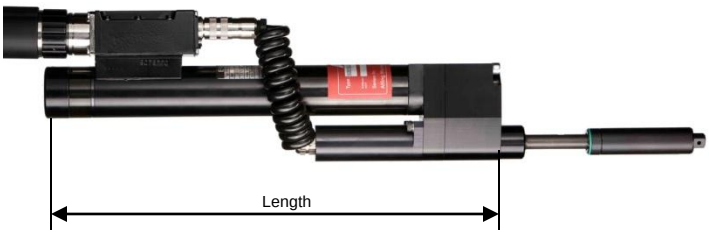
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 2 – Offset Drive

E 1.2.2

Illustration similar (ECR105 AOD150-50)



Size 2

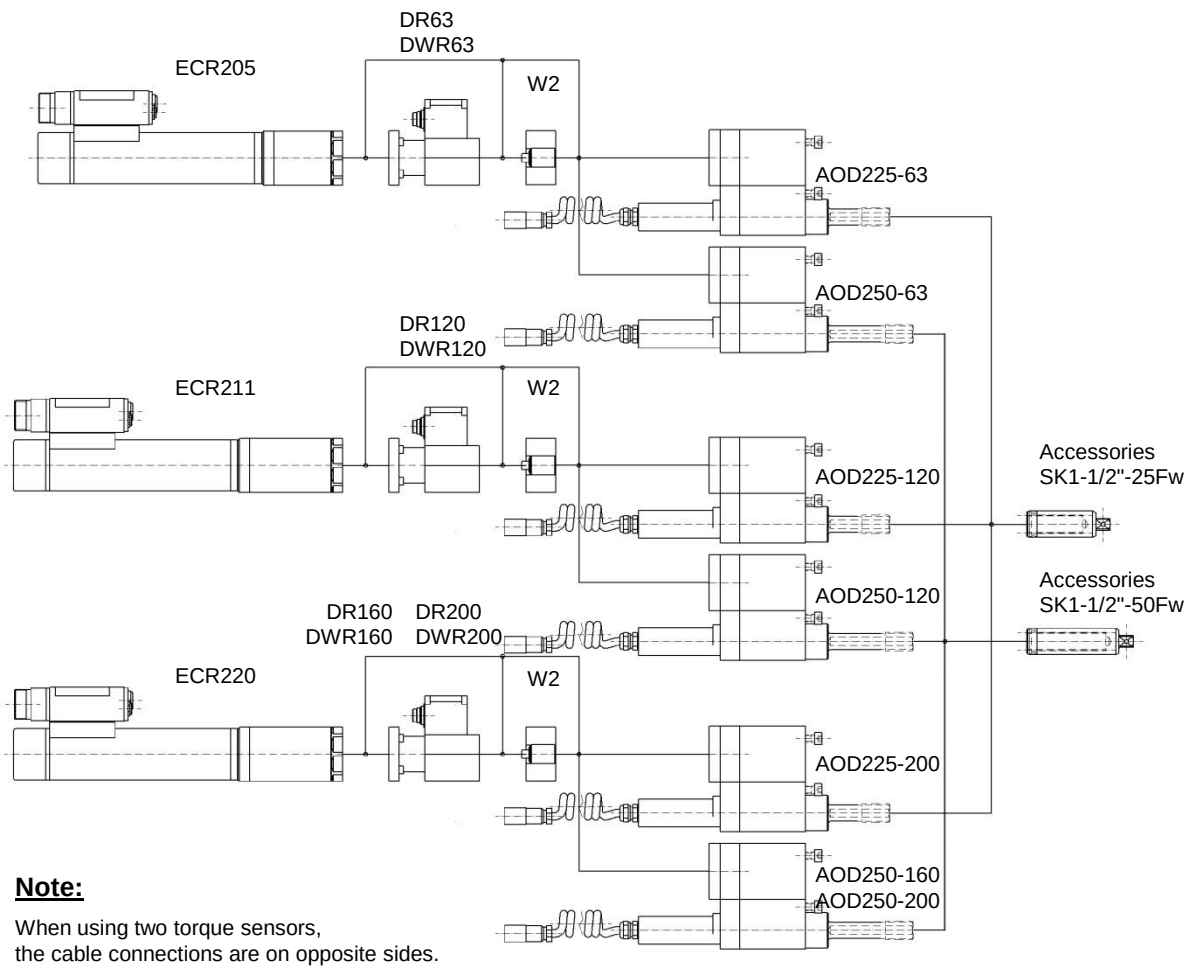
6 Nm up to 211 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	56	6 - 50	ECR205 AOD225-63	1114	430	6,9	67	792 0170
	56	6 - 50	ECR205 AOD250-63	1114	430	7,0	67	792 0171
	116	12 - 104	ECR211 AOD225-120	535	456	7,4	67	792 0172
	116	12 - 104	ECR211 AOD250-120	535	456	7,5	67	792 0173
	211	16 - 144	ECR220 AOD250-160	296	456	7,5	67	792 0174
	211	20 - 180	ECR220 AOD225-200	296	456	7,4	67	792 0175
	211	20 - 180	ECR220 AOD250-200	296	456	7,5	67	792 0176
	Built-in nutrunner with action torque sensor and angle encoder							
F	56	6 - 50	ECR205 W2 AOD225-63	1114	462	7,2	67	792 0177
	56	6 - 50	ECR205 W2 AOD250-63	1114	462	7,3	67	792 0178
	116	12 - 104	ECR211 W2 AOD225-120	535	488	7,7	67	792 0179
	116	12 - 104	ECR211 W2 AOD250-120	535	488	7,8	67	792 0180
	211	16 - 144	ECR220 W2 AOD250-160	296	488	7,8	67	792 0181
	211	20 - 180	ECR220 W2 AOD225-200	296	488	7,7	67	792 0182
	211	20 - 180	ECR220 W2 AOD250-200	296	488	7,8	67	792 0183
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	56	6 - 50	ECR205 DWR63 AOD225-63	1114	527	8,3	67	792 0184
	56	6 - 50	ECR205 DWR63 AOD250-63	1114	527	8,4	67	792 0185
	116	12 - 104	ECR211 DWR120 AOD225-120	535	553	8,8	67	792 0186
	116	12 - 104	ECR211 DWR120 AOD250-120	535	553	8,9	67	792 0187
	211	16 - 144	ECR220 DWR160 AOD250-160	296	553	8,9	67	792 0188
	211	20 - 180	ECR220 DWR200 AOD225-200	296	553	8,8	67	792 0189
	211	20 - 180	ECR220 DWR200 AOD250-200	296	553	8,9	67	792 0190
	Built-in nutrunner with redundant design							
H	56	6 - 50	ECR205 DR63 W2 AOD225-63	1114	559	8,6	67	792 0478
	56	6 - 50	ECR205 DR63 W2 AOD250-63	1114	559	8,7	67	792 0479
	116	12 - 104	ECR211 DR120 W2 AOD225-120	535	585	9,1	67	792 0480
	116	12 - 104	ECR211 DR120 W2 AOD250-120	535	585	9,2	67	792 0481
	211	16 - 144	ECR220 DR160 W2 AOD250-160	296	585	9,2	67	792 0482
	211	20 - 180	ECR220 DR200 W2 AOD225-200	296	585	9,1	67	792 0483
	211	20 - 180	ECR220 DR200 W2 AOD250-200	296	585	9,2	67	792 0484
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	56	6 - 50	ECR205 DWR63 W2 AOD225-63	1114	559	8,6	67	792 0191
	56	6 - 50	ECR205 DWR63 W2 AOD250-63	1114	559	8,7	67	792 0192
	116	12 - 104	ECR211 DWR120 W2 AOD225-120	535	585	9,1	67	792 0193
	116	12 - 104	ECR211 DWR120 W2 AOD250-120	535	585	9,2	67	792 0194
	211	16 - 144	ECR220 DWR160 W2 AOD250-160	296	585	9,2	67	792 0195
	211	20 - 180	ECR220 DWR200 W2 AOD225-200	296	585	9,1	67	792 0196
	211	20 - 180	ECR220 DWR200 W2 AOD250-200	296	585	9,2	67	792 0197

Combinations

Design with action torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

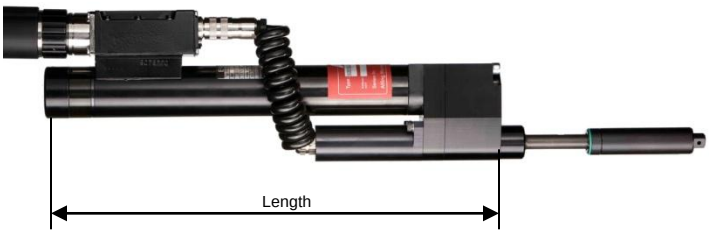
Depending on the bolt pattern,
an additional adapter may have to be provided.

The combination of reaction torque sensor DR with action torque sensor AOD is only available with module W2.

Built-In Nutrunner Size 3 – Offset Drive

E 1.2.3

Illustration similar (ECR105 AOD150-50)



Size 3

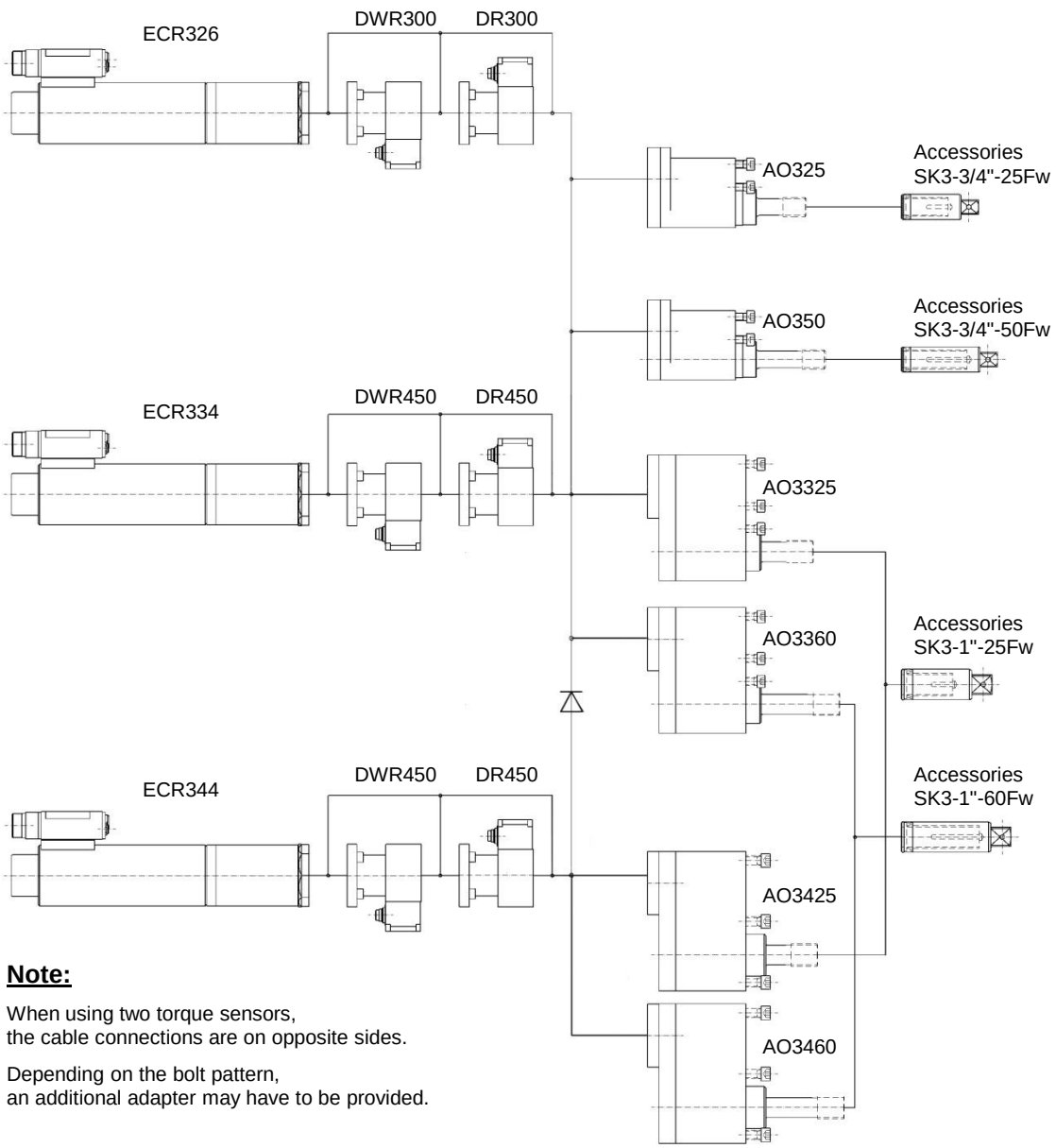
27 Nm up to 1075 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	267	94 - 240	ECR326 AO325	436	505	10,1	65	792 0198
	267	94 - 240	ECR326 AO350	436	505	10,2	65	792 0199
	345	121 - 310	ECR334 AO325	336	505	13,3	65	792 0200
	345	121 - 310	ECR334 AO350	336	505	13,4	65	792 0201
	449	158 - 404	ECR344 AO325	259	505	13,3	65	792 0202
	449	158 - 404	ECR344 AO350	259	505	13,4	65	792 0203
	495	174 - 445	ECR326 AO3325	235	519		67	792 0563
	495	174 - 445	ECR326 AO3360	235	519		67	792 0564
	642	225 - 577	ECR334 AO3325	182	519		67	792 0565
	642	225 - 577	ECR334 AO3360	182	519		67	792 0566
	834	292 - 750	ECR344 AO3325	140	519		67	792 0567
	834	292 - 750	ECR344 AO3360	140	519		67	792 0568
	1075	377 - 967	ECR344 AO3425	108	519		67	792 0569
	1075	377 - 967	ECR344 AO3460	108	519		67	792 0570
	Built-in nutrunner with reaction torque sensor for calibration							
B	267	94 - 240	ECR326 DWR300 AO325	436	602	12,8	65	792 0204
	267	94 - 240	ECR326 DWR300 AO350	436	602	12,9	65	792 0205
	345	121 - 310	ECR334 DWR450 AO325	336	602	16,0	65	792 0206
	345	121 - 310	ECR334 DWR450 AO350	336	602	16,1	65	792 0207
	449	158 - 404	ECR344 DWR450 AO325	259	602	16,0	65	792 0208
	449	158 - 404	ECR344 DWR450 AO350	259	602	16,1	65	792 0209
	495	174 - 445	ECR326 DWR300 AO3325	235	616		67	792 0677
	495	174 - 445	ECR326 DWR300 AO3360	235	616		67	792 0678
	642	225 - 577	ECR334 DWR450 AO3325	182	616		67	792 0679
	642	225 - 577	ECR334 DWR450 AO3360	182	616		67	792 0680
	834	292 - 750	ECR344 DWR450 AO3325	140	616		67	792 0681
	834	292 - 750	ECR344 DWR450 AO3360	140	616		67	792 0682
	1075	377 - 967	ECR344 DWR450 AO3425	108	616		67	792 0683
	1075	377 - 967	ECR344 DWR450 AO3460	108	616		67	792 0684

Combinations

Design with reaction torque sensor



Note:

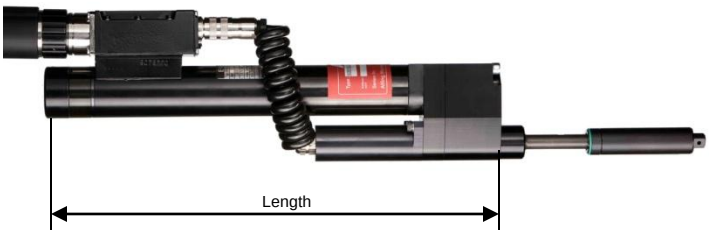
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 3 – Offset Drive

E 1.2.3

Illustration similar (ECR105 AOD150-50)



Size 3

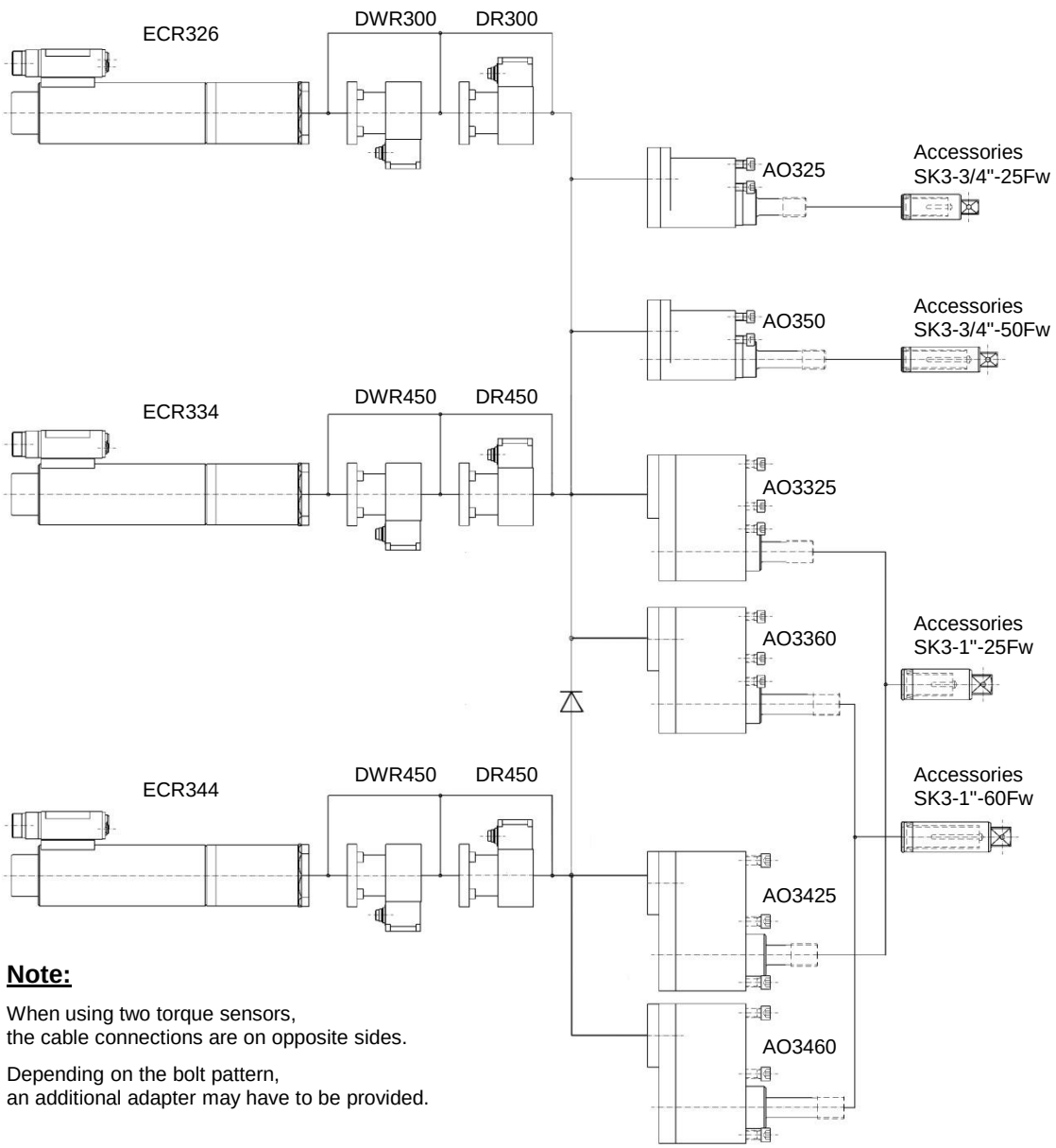
27 Nm up to 1075 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with reaction torque sensor							
C	267	54 - 240	ECR326 DR300 AO325	436	602	12,7	65	792 0450
	267	54 - 240	ECR326 DR300 AO350	436	602	12,8	65	792 0451
	345	69 - 310	ECR334 DR450 AO325	336	602	15,9	65	792 0452
	345	69 - 310	ECR334 DR450 AO350	336	602	16,0	65	792 0453
	449	90 - 404	ECR344 DR450 AO325	259	602	15,9	65	792 0454
	449	90 - 404	ECR344 DR450 AO350	259	602	16,0	65	792 0455
	495	99 - 445	ECR326 DR300 AO3325	235	616		67	792 0571
	495	99 - 445	ECR326 DR300 AO3360	235	616		67	792 0572
	642	129 - 577	ECR334 DR450 AO3325	182	616		67	792 0573
	642	129 - 577	ECR334 DR450 AO3360	182	616		67	792 0574
	834	167 - 750	ECR344 DR450 AO3325	140	616		67	792 0575
	834	167 - 750	ECR344 DR450 AO3360	140	616		67	792 0576
	1075	215 - 967	ECR344 DR450 AO3425	108	616		67	792 0577
	1075	215 - 967	ECR344 DR450 AO3460	108	616		67	792 0578
	Built-in nutrunner with two reaction torque sensors							
D	267	54 - 240	ECR326 DWR300 DR300 AO325	436	699	15,3	65	792 0468
	267	54 - 240	ECR326 DWR300 DR300 AO350	436	699	15,4	65	792 0469
	345	69 - 310	ECR334 DWR450 DR450 AO325	336	699	18,5	65	792 0470
	345	69 - 310	ECR334 DWR450 DR450 AO350	336	699	18,5	65	792 0471
	449	90 - 404	ECR344 DWR450 DR450 AO325	259	699	18,5	65	792 0472
	449	90 - 404	ECR344 DWR450 DR450 AO350	259	699	18,6	65	792 0473
	495	99 - 445	ECR326 DWR300 DR300 AO3325	235	713		67	792 0579
	495	99 - 445	ECR326 DWR300 DR300 AO3360	235	713		67	792 0580
	642	129 - 577	ECR334 DWR450 DR450 AO3325	182	713		67	792 0581
	642	129 - 577	ECR334 DWR450 DR450 AO3360	182	713		67	792 0582
	834	167 - 750	ECR344 DWR450 DR450 AO3325	140	713		67	792 0583
	834	167 - 750	ECR344 DWR450 DR450 AO3360	140	713		67	792 0584
	1075	215 - 967	ECR344 DWR450 DR450 AO3450	108	713		67	792 0585
	1075	215 - 967	ECR344 DWR450 DR450 AO3460	108	713		67	792 0586

Combinations

Design with reaction torque sensor



Note:

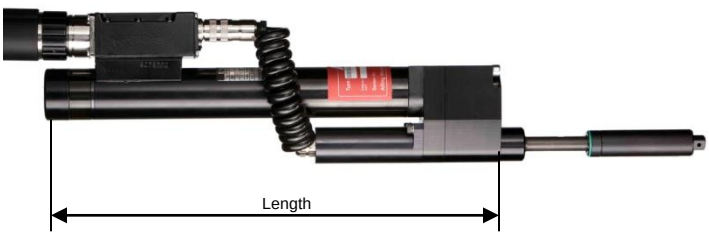
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 3 – Offset Drive

E 1.2.3

Illustration similar (ECR105 AOD150-50)



Size 3

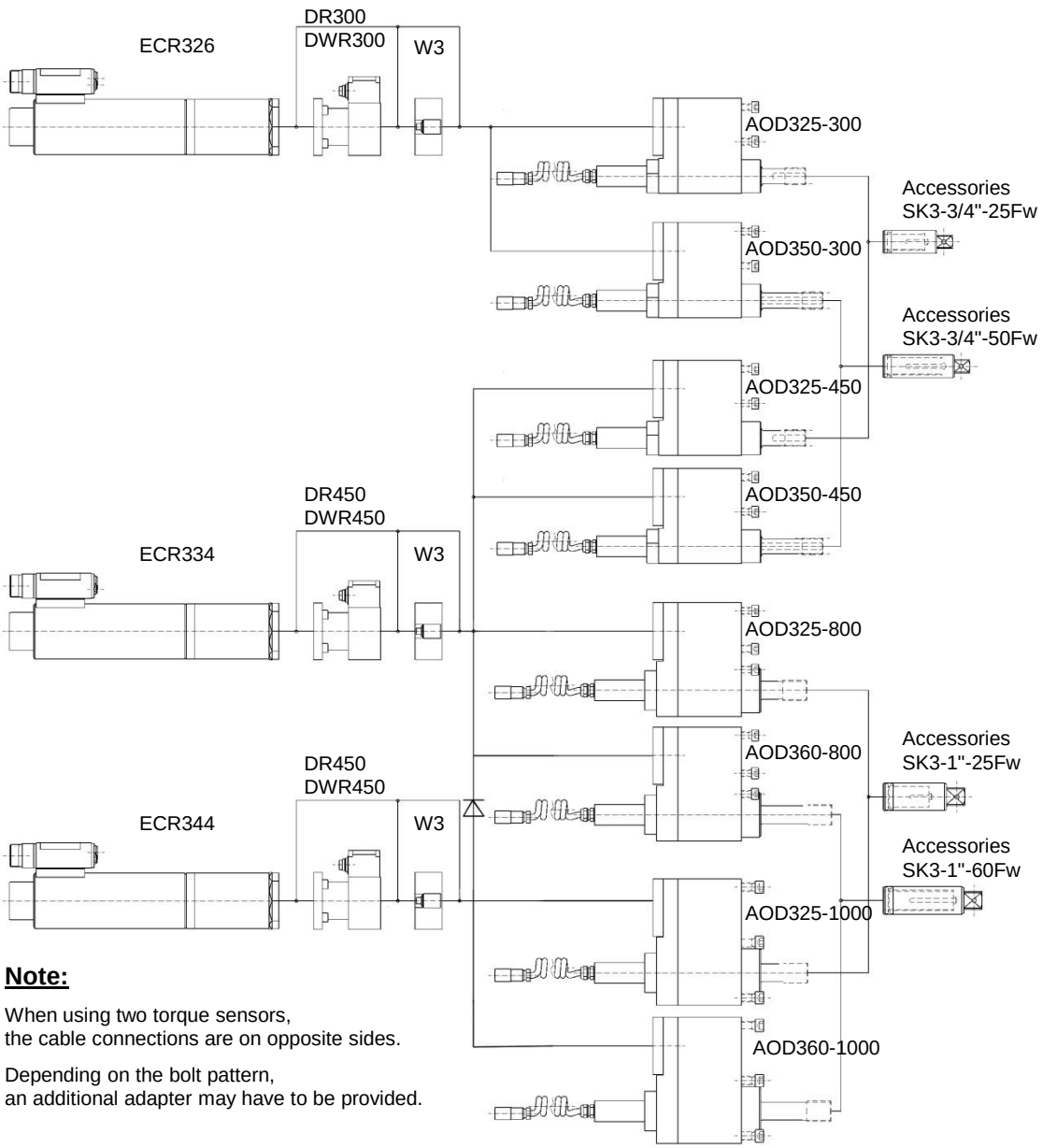
27 Nm up to 1075 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	268	27 - 241	ECR326 AOD325-300	433	518	11,5	65	792 0216
	268	27 - 241	ECR326 AOD350-300	433	518	11,6	65	792 0217
	347	35 - 312	ECR334 AOD325-450	334	518	14,7	65	792 0218
	347	35 - 312	ECR334 AOD350-450	334	518	14,8	65	792 0219
	642	65 - 577	ECR334 AOD325-800	181	518	18,4	65	792 0220
	642	65 - 577	ECR334 AOD360-800	181	518	18,5	65	792 0221
	450	45 - 405	ECR344 AOD325-450	258	518	14,7	65	792 0222
	450	45 - 404	ECR344 AOD350-450	258	518	14,8	65	792 0223
	834	80 - 720	ECR344 AOD325-800	140	518	18,4	65	792 0224
	834	80 - 720	ECR344 AOD360-800	140	518	18,5	65	792 0601
	1075	100 - 900	ECR344 AOD325-1000	108	518	21,1	65	792 0226
	1075	100 - 900	ECR344 AOD360-1000	108	518	21,2	65	792 0227
	Built-in nutrunner with action torque sensor and angle encoder							
F	268	27 - 241	ECR326 W3 AOD325-300	433	557	16,0	65	792 0228
	268	27 - 241	ECR326 W3 AOD350-300	433	557	16,1	65	792 0229
	347	35 - 312	ECR334 W3 AOD325-450	334	557	19,2	65	792 0230
	347	35 - 312	ECR334 W3 AOD350-450	334	557	19,3	65	792 0231
	642	65 - 577	ECR334 W3 AOD325-800	181	557	22,9	65	792 0232
	642	65 - 577	ECR334 W3 AOD360-800	181	557	23,0	65	792 0233
	450	45 - 405	ECR344 W3 AOD325-450	258	557	19,2	65	792 0234
	450	45 - 404	ECR344 W3 AOD350-450	258	557	19,3	65	792 0235
	834	80 - 720	ECR344 W3 AOD325-800	140	557	22,9	65	792 0236
	834	80 - 720	ECR344 W3 AOD360-800	140	557	23,0	65	792 0237
	1075	100 - 900	ECR344 W3 AOD325-1000	108	557	25,6	65	792 0238
	1075	100 - 900	ECR344 W3 AOD360-1000	108	557	25,7	65	792 0239
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	268	27 - 241	ECR326 DWR300 AOD325-300	433	615	14,2	65	792 0240
	268	27 - 241	ECR326 DWR300 AOD350-300	433	615	14,3	65	792 0241
	347	35 - 312	ECR334 DWR450 AOD325-450	334	615	17,5	65	792 0242
	347	35 - 312	ECR334 DWR450 AOD350-450	334	615	17,6	65	792 0243
	642	65 - 577	ECR334 DWR450 AOD325-800	181	615	21,1	65	792 0244
	642	65 - 577	ECR334 DWR450 AOD360-800	181	615	21,2	65	792 0245
	450	45 - 405	ECR344 DWR450 AOD325-450	258	615	17,5	65	792 0246
	450	45 - 404	ECR344 DWR450 AOD350-450	258	615	17,6	65	792 0247
	834	80 - 720	ECR344 DWR450 AOD325-800	140	615	21,1	65	792 0248
	834	80 - 720	ECR344 DWR450 AOD360-800	140	615	21,2	65	792 0249
	1075	100 - 900	ECR344 DWR450 AOD325-1000	108	615	23,8	65	792 0250
	1075	100 - 900	ECR344 DWR450 AOD360-1000	108	615	23,9	65	792 0251

Combinations

Design with action torque sensor



Note:

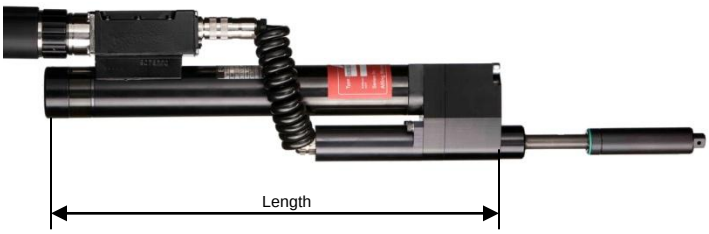
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 3 – Offset Drive

E 1.2.3

Illustration similar (ECR105 AOD150-50)



Size 3

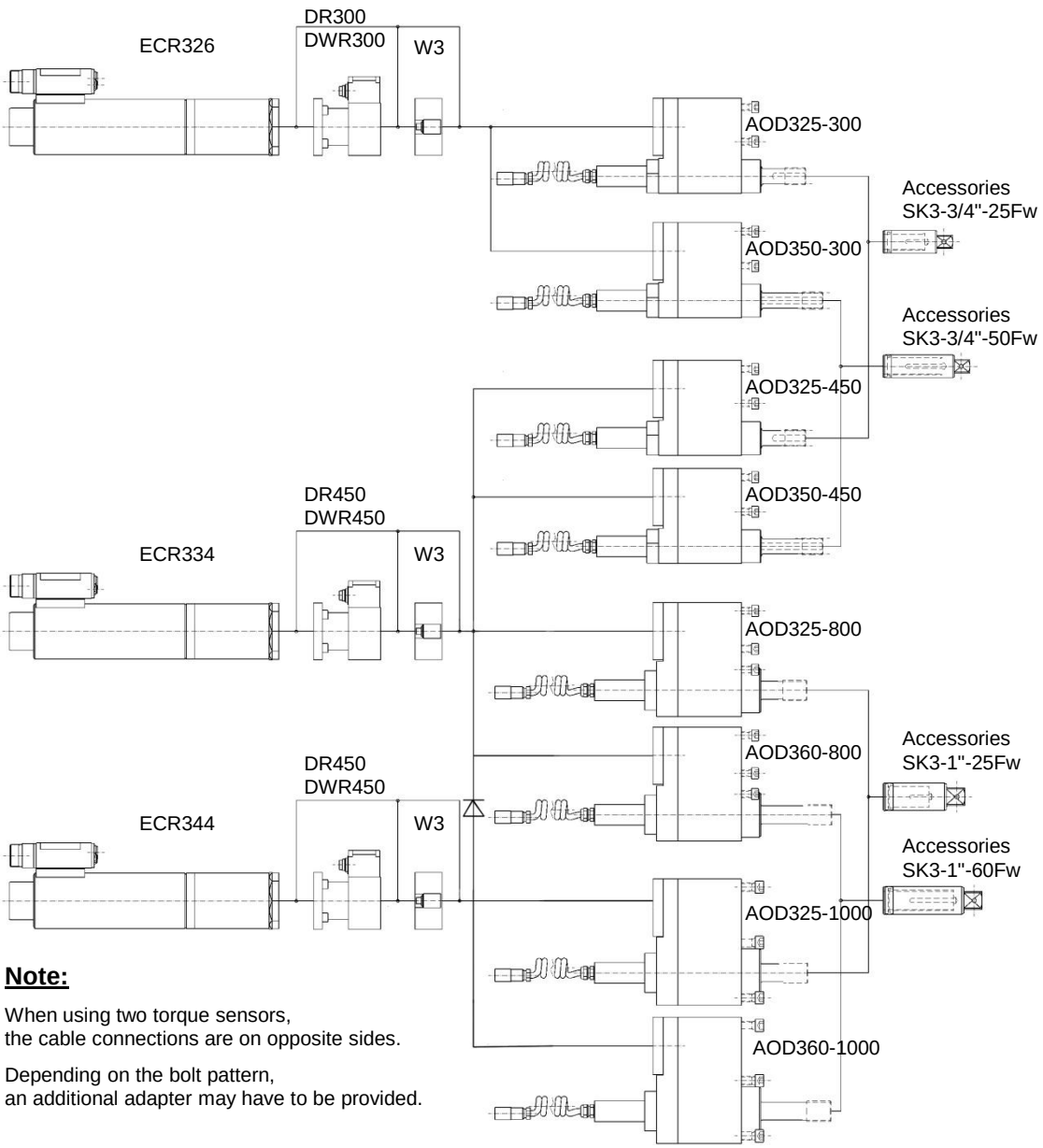
27 Nm up to 1075 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with redundant design							
H	268	27 - 241	ECR326 DR300 W3 AOD325-300	433	654	14,9	65	792 0485
	268	27 - 241	ECR326 DR300 W3 AOD350-300	433	654	15,0	65	792 0486
	347	35 - 312	ECR334 DR450 W3 AOD325-450	334	654	18,2	65	792 0487
	347	35 - 312	ECR334 DR450 W3 AOD350-450	334	654	18,3	65	792 0488
	642	65 - 577	ECR334 DR450 W3 AOD325-800	181	654	21,8	65	792 0489
	642	65 - 577	ECR334 DR450 W3 AOD360-800	181	654	21,9	65	792 0490
	450	45 - 405	ECR344 DR450 W3 AOD325-450	258	654	18,2	65	792 0491
	450	45 - 405	ECR344 DR450 W3 AOD350-450	258	654	18,3	65	792 0492
	834	80 - 720	ECR344 DR450 W3 AOD325-800	140	654	21,8	65	792 0493
	834	80 - 720	ECR344 DR450 W3 AOD360-800	140	654	21,9	65	792 0494
	1075	100 - 900	ECR344 DR450 W3 AOD325-1000	108	654	24,5	65	792 0495
	1075	100 - 900	ECR344 DR450 W3 AOD360-1000	108	654	24,6	65	792 0496
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	268	27 - 241	ECR326 DWR300 W3 AOD325-300	433	654	14,9	65	792 0252
	268	27 - 241	ECR326 DWR300 W3 AOD350-300	433	654	15,0	65	792 0253
	347	35 - 312	ECR334 DWR450 W3 AOD325-450	334	654	18,2	65	792 0254
	347	35 - 312	ECR334 DWR450 W3 AOD350-450	334	654	18,3	65	792 0255
	642	65 - 577	ECR334 DWR450 W3 AOD325-800	181	654	21,8	65	792 0256
	642	65 - 577	ECR334 DWR450 W3 AOD360-800	181	654	21,9	65	792 0257
	450	45 - 405	ECR344 DWR450 W3 AOD325-450	258	654	18,2	65	792 0258
	450	45 - 405	ECR344 DWR450 W3 AOD350-450	258	654	18,3	65	792 0259
	834	80 - 720	ECR344 DWR450 W3 AOD325-800	140	654	21,8	65	792 0260
	834	80 - 720	ECR344 DWR450 W3 AOD360-800	140	654	21,9	65	792 0261
	1075	100 - 900	ECR344 DWR450 W3 AOD325-1000	108	654	24,5	65	792 0262
	1075	100 - 900	ECR344 DWR450 W3 AOD360-1000	108	654	24,6	65	792 0263

Combinations

Design with action torque sensor



Note:

When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Notes

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HIGH POWER Built-In Nutrunner

E 1.3

Built-In Nutrunner – Angle Drive

Torque up to 642 Nm
Speed up to 1200 rpm

HIGH POWER Built-In Nutrunner

E 1.3

Designation Code Subassemblies

1 Motor and gear units

Design

ECR105

ECR = Built-in tool, brushless driving motor, Resolver
1 = Size 1, 2, 3
05 = Capacity x 10 in Nm

2 Torque sensors

Reaction torque sensor

DR50

D = Torque sensor
R = Reaction torque sensor
50 = Nominal torque of the torque sensor

Reaction torque sensor
with angle encoder

DWR50

D = Torque sensor
W = Angle encoder
R = Reaction torque sensor
50 = Nominal torque of the torque sensor

3 Drive units

Angle design
without torque sensor

AW125

A = Drive
W = Angle drive
1 = Size 1, 2, 3
25 = Spring travel 25mm; 50mm

Angle design
with action torque sensor

AWD150-50

A = Drive
W = Angle drive
D = Action torque sensor
1 = Size 1, 2, 3
50 = Spring travel 25mm; 50mm
50 = Nominal torque of the torque sensor

Angle encoder subassembly
for angle drive AWD

W1

W = Angle encoder subassembly
1 = Size 1, 2, 3

4 Socket adapter designation

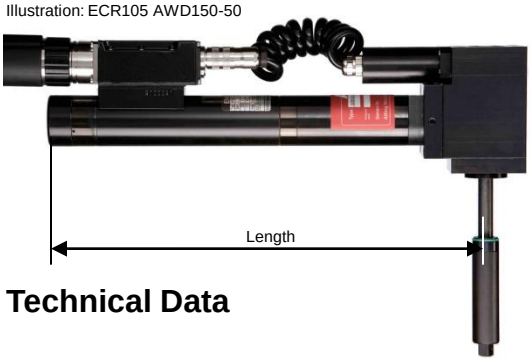
SK1-1/2-50

SK = Socket adapter
1 = Size 1, 2, 3
½ = Size of the square drive in inches
50 = Spring travel 25mm; 50mm

Built-In Nutrunner Size 1 – Angle Drive

E 1.3.1

Illustration: ECR105 AWD150-50



Size 1

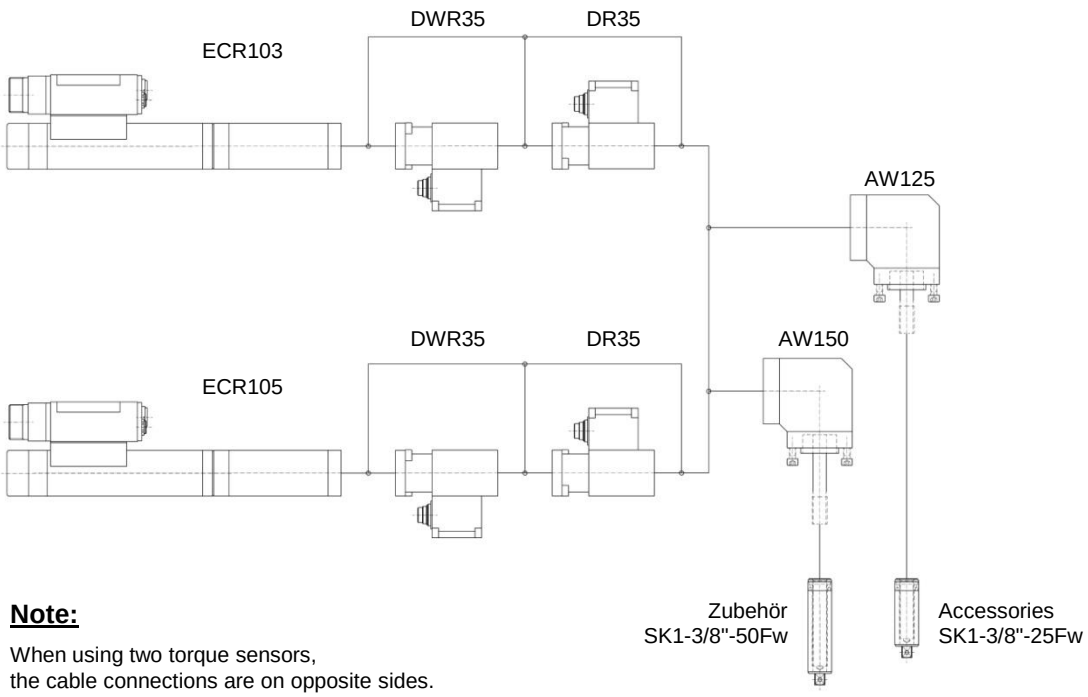
2 Nm up to 48 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	32	12 - 28	ECR103 AW125	990	359	4,1	67	792 0264
	32	12 - 28	ECR103 AW150	990	359	4,2	67	792 0265
	48	17 - 43	ECR105 AW125	661	359	4,1	67	792 0266
	48	17 - 43	ECR105 AW150	661	359	4,2	67	792 0267
	Built-in nutrunner with reaction torque sensor for calibration							
B	32	12 - 28	ECR103 DWR35 AW125	990	453	5,1	67	792 0268
	32	12 - 28	ECR103 DWR35 AW150	990	453	5,2	67	792 0269
	48	17 - 43	ECR105 DWR50 AW125	661	453	5,1	67	792 0270
	48	17 - 43	ECR105 DWR50 AW150	661	453	5,2	67	792 0271
	Built-in nutrunner with reaction torque sensor							
C	32	7 - 28	ECR103 DR35 AW125	990	453	5,0	67	792 0497
	32	7 - 28	ECR103 DR35 AW150	990	453	5,1	67	792 0498
	47	10 - 42	ECR105 DR50 AW125	661	453	5,0	67	792 0499
	47	10 - 42	ECR105 DR50 AW150	661	453	5,1	67	792 0500
	Built-in nutrunner with two reaction torque sensors							
D	32	7 - 28	ECR103 DWR35 DR35 AW125	990	547	6,0	67	792 0513
	32	7 - 28	ECR103 DWR35 DR35 AW150	990	547	6,1	67	792 0514
	47	10 - 42	ECR105 DWR50 DR50 AW125	661	547	6,0	67	792 0515
	47	10 - 42	ECR105 DWR50 DR50 AW150	661	547	6,1	67	792 0516

Combinations

Design with reaction torque sensor



Note:

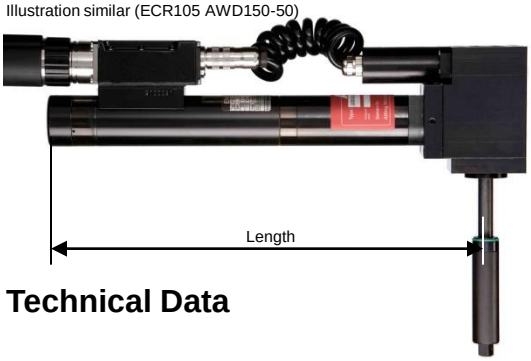
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided..

Built-In Nutrunner Size 1 – Angle Drive

E 1.3.1

Illustration similar (ECR105 AWD150-50)



Size 1

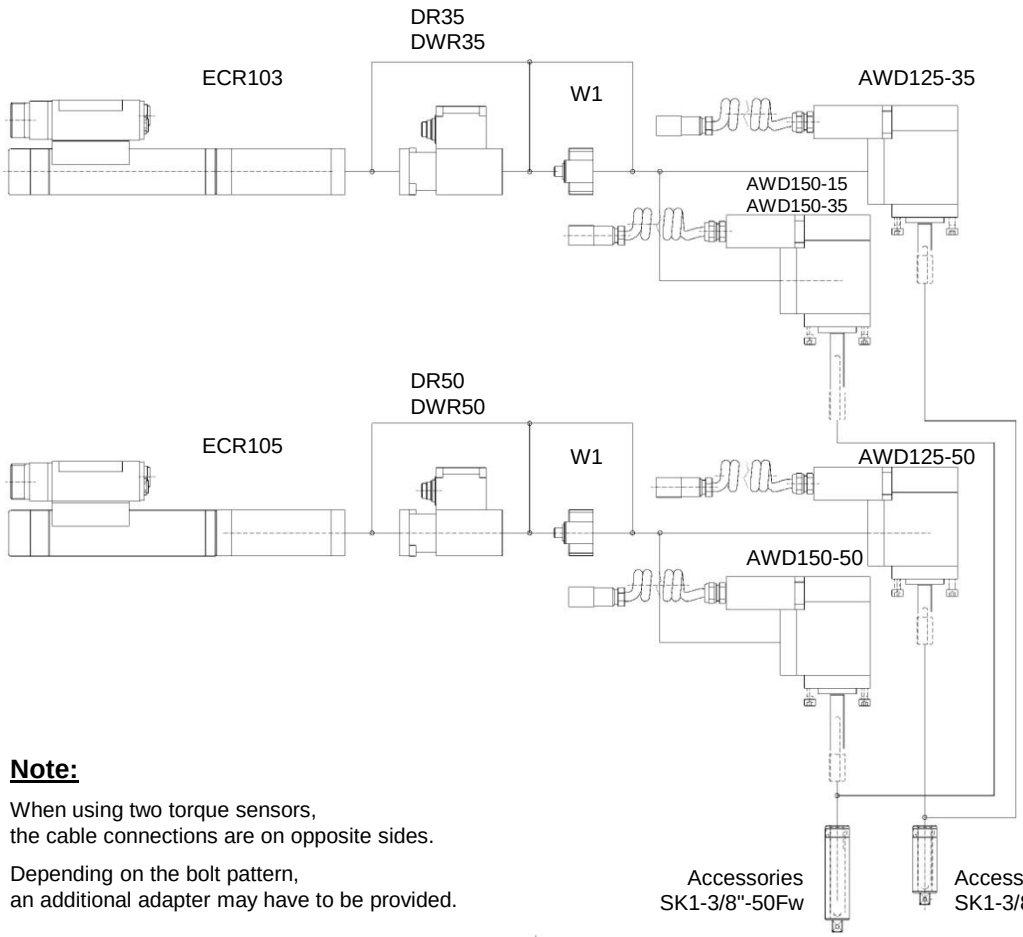
2 Nm up to 48 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	32	4 - 28	ECR103 AWD125-35	990	359	4,5	67	792 0276
	32	2 - 13	ECR103 AWD150-15	990	359	4,6	67	792 0277
	32	4 - 28	ECR103 AWD150-35	990	359	4,6	67	792 0278
	48	5 - 43	ECR105 AWD125-50	661	359	4,5	67	792 0279
	48	5 - 43	ECR105 AWD150-50	661	359	4,6	67	792 0280
	Built-in nutrunner with action torque sensor and angle encoder							
F	32	4 - 28	ECR103 W1 AWD125-35	990	381	4,6	67	792 0281
	32	2 - 13	ECR103 W1 AWD150-15	990	381	4,7	67	792 0282
	32	4 - 28	ECR103 W1 AWD150-35	990	381	4,7	67	792 0283
	48	5 - 43	ECR105 W1 AWD125-50	661	381	4,6	67	792 0284
	48	5 - 43	ECR105 W1 AWD150-50	661	381	4,7	67	792 0285
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	32	4 - 28	ECR103 DWR35 AWD125-35	990	453	5,4	67	792 0286
	32	2 - 13	ECR103 DWR35 AWD150-15	990	453	5,6	67	792 0287
	32	4 - 28	ECR103 DWR35 AWD150-35	990	453	5,6	67	792 0288
	48	5 - 43	ECR105 DWR50 AWD125-50	661	453	5,4	67	792 0289
	48	5 - 43	ECR105 DWR50 AWD150-50	661	453	5,6	67	792 0290
	Built-in nutrunner with redundant design							
H	32	4 - 28	ECR103 DR35 W1 AWD125-35	990	475	5,5	67	792 0529
	32	2 - 13	ECR103 DR35 W1 AWD150-15	990	475	5,7	67	792 0530
	32	4 - 28	ECR103 DR35 W1 AWD150-35	990	475	5,7	67	792 0531
	48	5 - 43	ECR105 DR50 W1 AWD125-50	661	475	5,5	67	792 0532
	48	5 - 43	ECR105 DR50 W1 AWD150-50	661	475	5,7	67	792 0533
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	32	4 - 28	ECR103 DWR35 W1 AWD125-35	990	475	5,5	67	792 0291
	32	2 - 13	ECR103 DWR35 W1 AWD150-15	990	475	5,7	67	792 0292
	32	4 - 28	ECR103 DWR35 W1 AWD150-35	990	475	5,7	67	792 0293
	48	5 - 43	ECR105 DWR50 W1 AWD125-50	661	475	5,5	67	792 0294
	48	5 - 43	ECR105 DWR50 W1 AWD150-50	661	475	5,7	67	792 0295

Combinations

Design with action torque sensor



Note:

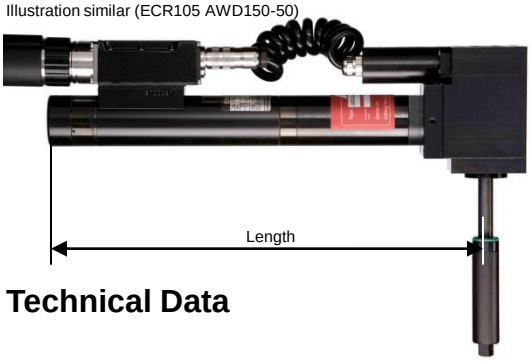
When using two torque sensors,
the cable connections are on opposite sides.

Depending on the bolt pattern,
an additional adapter may have to be provided.

Built-In Nutrunner Size 2 – Angle Drive

E 1.3.2

Illustration similar (ECR105 AWD150-50)



Size 2

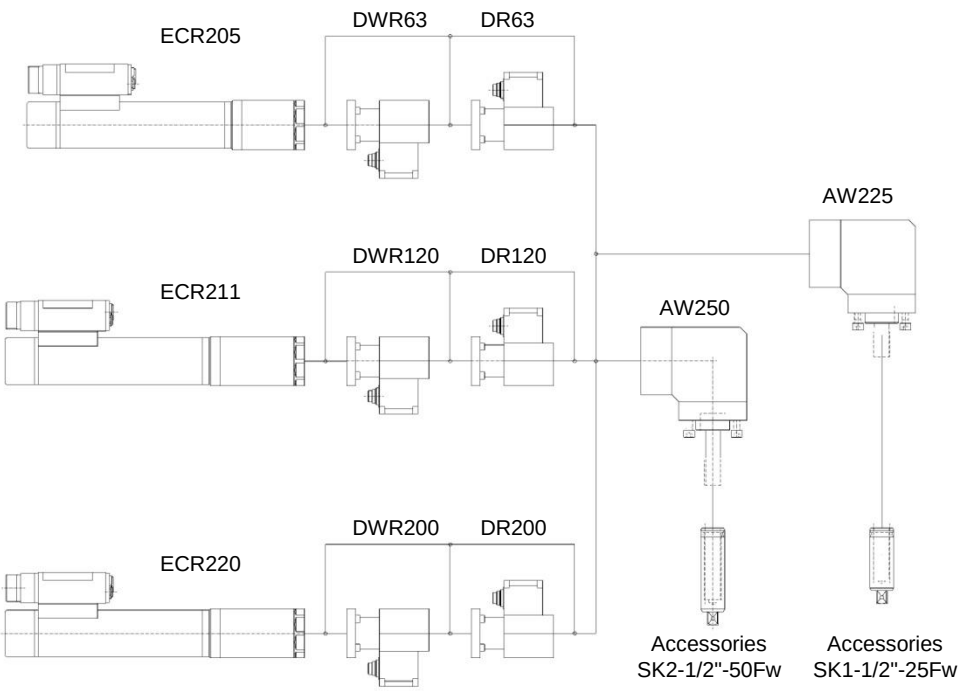
6 Nm up to 196 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	52	19 - 46	ECR205 AW225	1200	412	8,1	67	792 0296
	52	19 - 46	ECR205 AW250	1200	412	8,2	67	792 0297
	108	38 - 97	ECR211 AW225	577	438	8,6	67	792 0298
	108	38 - 97	ECR211 AW250	577	438	8,7	67	792 0299
	196	69 - 176	ECR220 AW225	319	438	8,6	67	792 0300
	196	69 - 176	ECR220 AW250	319	438	8,7	67	792 0301
	Built-in nutrunner with reaction torque sensor for calibration							
B	52	19 - 46	ECR205 DWR63 AW225	1200	509	9,6	67	792 0302
	52	19 - 46	ECR205 DWR63 AW250	1200	509	9,7	67	792 0303
	108	38 - 97	ECR211 DWR120 AW225	577	535	10,1	67	792 0304
	108	38 - 97	ECR211 DWR120 AW250	577	535	10,2	67	792 0305
	196	69 - 176	ECR220 DWR200 AW225	319	535	10,1	67	792 0306
	196	69 - 176	ECR220 DWR200 AW250	319	535	10,2	67	792 0307
	Built-in nutrunner with reaction torque sensor							
C	52	11 - 46	ECR205 DR63 AW225	1200	509	9,5	67	792 0501
	52	11 - 46	ECR205 DR63 AW250	1200	509	9,6	67	792 0502
	108	22 - 97	ECR211 DR120 AW225	577	535	10,0	67	792 0503
	108	22 - 97	ECR211 DR120 AW250	577	535	10,1	67	792 0504
	190	38 - 171	ECR220 DR200 AW225	319	535	10,0	67	792 0505
	190	38 - 171	ECR220 DR200 AW250	319	535	10,1	67	792 0506
	Built-in nutrunner with two reaction torque sensors							
D	52	11 - 46	ECR205 DWR63 DR63 AW225	1200	606	10,9	67	792 0517
	52	11 - 46	ECR205 DWR63 DR63 AW250	1200	606	10,6	67	792 0518
	108	22 - 97	ECR211 DWR120 DR120 AW225	577	632	11,4	67	792 0519
	108	22 - 97	ECR211 DWR120 DR120 AW250	577	632	11,5	67	792 0520
	190	38 - 171	ECR220 DWR200 DR200 AW225	319	632	11,4	67	792 0521
	190	38 - 171	ECR220 DWR200 DR200 AW250	319	632	11,5	67	792 0522

Combinations

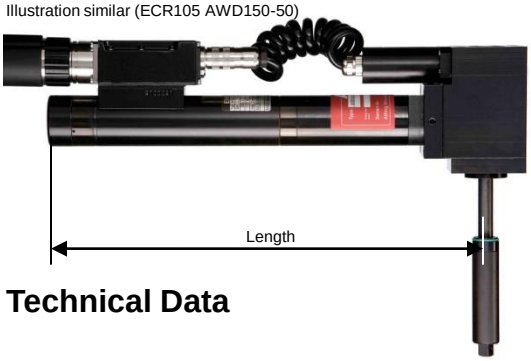
Design with reaction torque sensor



Built-In Nutrunner Size 2 – Angle Drive

E 1.3.2

Illustration similar (ECR105 AWD150-50)



Size 2

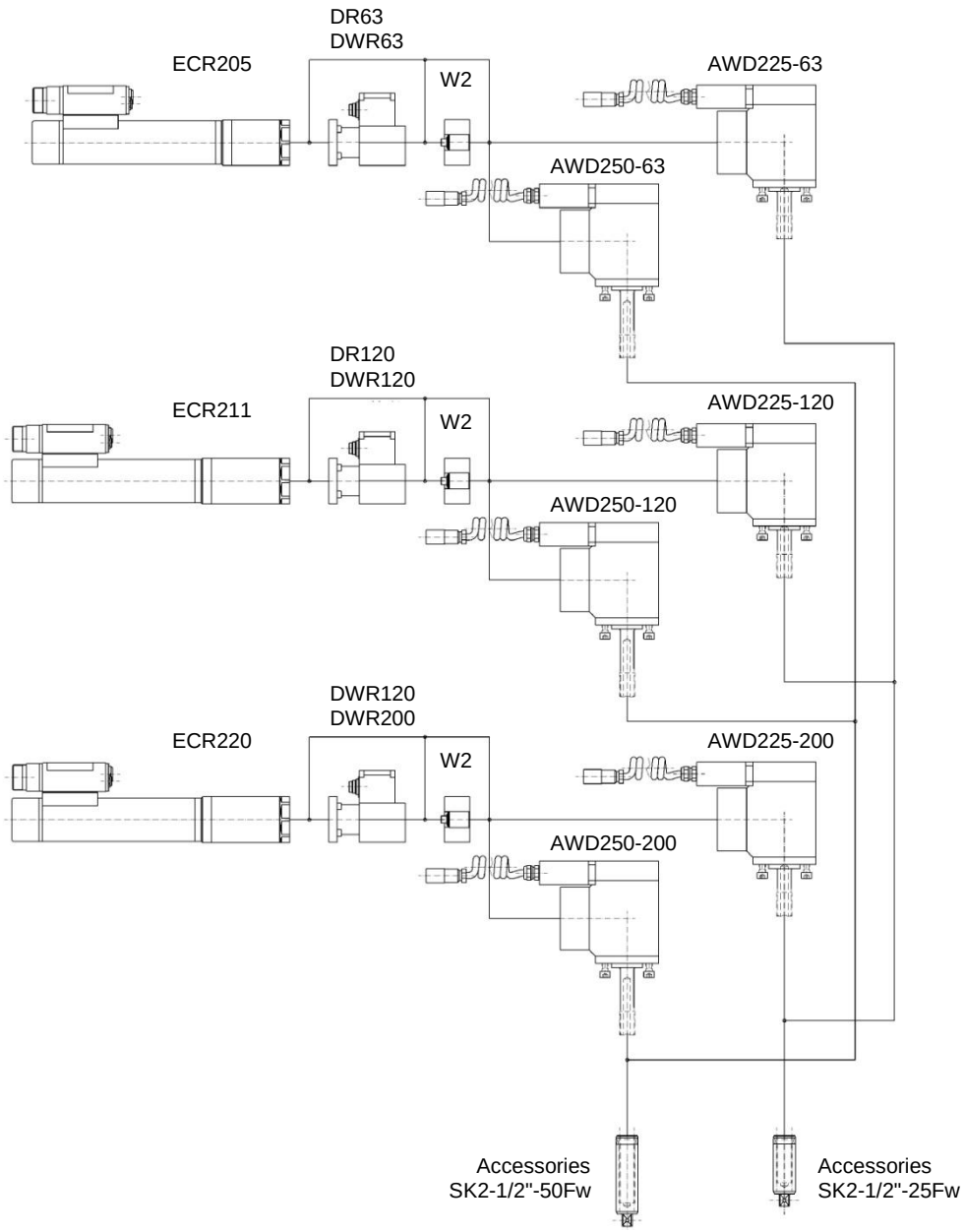
6 Nm up to 196 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	52	6 - 46	ECR205 AWD225-63	1200	412	8,6	67	792 0314
	52	6 - 46	ECR205 AWD250-63	1200	412	8,7	67	792 0315
	108	11 - 97	ECR211 AWD225-120	577	438	9,1	67	792 0316
	108	11 - 97	ECR211 AWD250-120	577	438	9,2	67	792 0317
	196	20 - 176	ECR220 AWD225-200	319	438	9,1	67	792 0318
	196	20 - 176	ECR220 AWD250-200	319	438	9,2	67	792 0319
	Built-in nutrunner with action torque sensor and angle encoder							
F	52	6 - 46	ECR205 W2 AWD225-63	1200	444	8,9	67	792 0320
	52	6 - 46	ECR205 W2 AWD250-63	1200	444	9,0	67	792 0321
	108	11 - 97	ECR211 W2 AWD225-120	577	470	9,4	67	792 0322
	108	11 - 97	ECR211 W2 AWD250-120	577	470	9,5	67	792 0323
	196	20 - 176	ECR220 W2 AWD225-200	319	470	9,4	67	792 0324
	196	20 - 176	ECR220 W2 AWD250-200	319	470	9,5	67	792 0325
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	52	6 - 46	ECR205 DWR63 AWD225-63	1200	509	10,0	67	792 0326
	52	6 - 46	ECR205 DWR63 AWD250-63	1200	509	10,1	67	792 0327
	108	11 - 97	ECR211 DWR120 AWD225-120	577	535	10,5	67	792 0328
	108	11 - 97	ECR211 DWR120 AWD250-120	577	535	10,6	67	792 0329
	196	20 - 176	ECR220 DWR200 AWD225-200	319	535	10,5	67	792 0330
	196	20 - 176	ECR220 DWR200 AWD250-200	319	535	10,6	67	792 0331
	Built-in nutrunner with redundant design							
H	52	6 - 46	ECR205 DR63 W2 AWD225-63	1200	541	10,3	67	792 0534
	52	6 - 46	ECR205 DR63 W2 AWD250-63	1200	541	10,4	67	792 0535
	108	11 - 97	ECR211 DR120 W2 AWD225-120	577	567	10,8	67	792 0536
	108	11 - 97	ECR211 DR120 W2 AWD250-120	577	567	10,9	67	792 0537
	196	20 - 176	ECR220 DR200 W2 AWD225-200	319	567	10,8	67	792 0538
	196	20 - 176	ECR220 DR200 W2 AWD250-200	319	567	10,9	67	792 0539
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	52	6 - 46	ECR205 DWR63 W2 AWD225-63	1200	541	10,3	67	792 0332
	52	6 - 46	ECR205 DWR63 W2 AWD250-63	1200	541	10,4	67	792 0333
	108	11 - 97	ECR211 DWR120 W2 AWD225-120	577	567	10,8	67	792 0334
	108	11 - 97	ECR211 DWR120 W2 AWD250-120	577	567	10,9	67	792 0335
	196	20 - 176	ECR220 DWR200 W2 AWD225-200	319	567	10,8	67	792 0336
	196	20 - 176	ECR220 DWR200 W2 AWD250-200	319	567	10,9	67	792 0337

Combinations

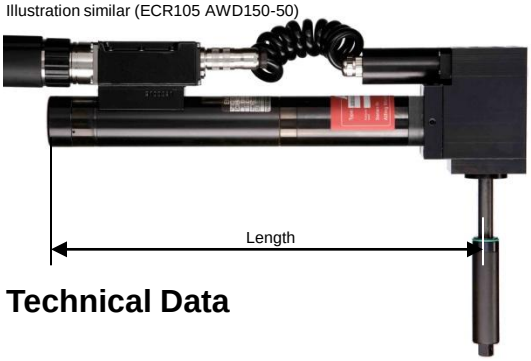
Design with action torque sensor



Built-In Nutrunner Size 3 – Angle Drive

E 1.3.3

Illustration similar (ECR105 AWD150-50)



Size 3

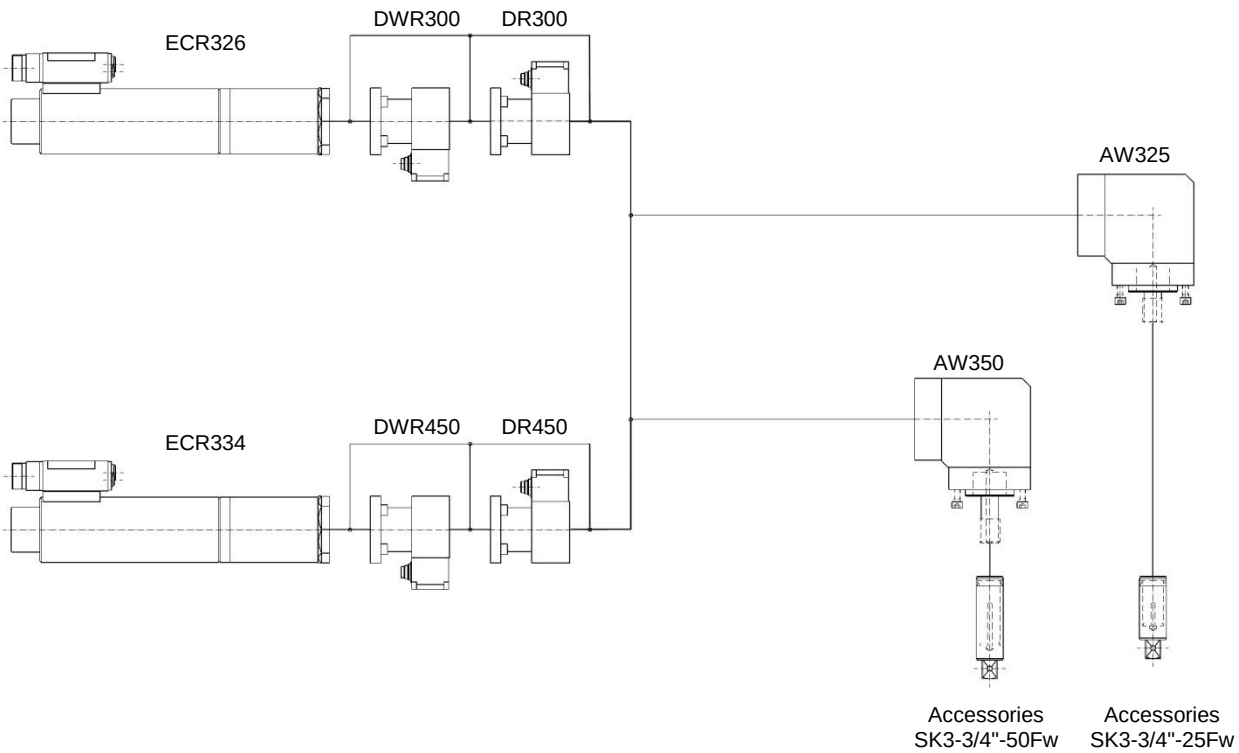
25 Nm up to 642 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner without torque sensor							
A	247	87 - 222	ECR326 AW325	470	482	13,0	65	792 0338
	247	87 - 222	ECR326 AW350	470	482	13,4	65	792 0339
	321	105 - 270	ECR334 AW325	362	482	16,2	65	792 0340
	321	105 - 270	ECR334 AW350	362	482	16,6	65	792 0341
	495	174 - 445	ECR326 AW3325	235	498	15,0	65	792 0545
	495	174 - 445	ECR326 AW3350	235	498	15,0	65	792 0546
	642	210 - 540	ECR334 AW3325	181	498	18,2	65	792 0547
	642	210 - 540	ECR334 AW3350	181	498	18,2	65	792 0548
	Built-in nutrunner with reaction torque sensor for calibration							
B	247	87 - 222	ECR326 DWR300 AW325	470	579	15,8	65	792 0344
	247	87 - 222	ECR326 DWR300 AW350	470	579	16,2	65	792 0345
	321	105 - 270	ECR334 DWR450 AW325	362	579	19,0	65	792 0346
	321	105 - 270	ECR334 DWR450 AW350	362	579	19,4	65	792 0347
	495	174 - 445	ECR326 DWR300 AW3325	235	595	17,7	65	792 0685
	495	174 - 445	ECR326 DWR300 AW3350	235	595	17,7	65	792 0686
	642	210 - 540	ECR334 DWR450 AW3325	181	595	20,9	65	792 0687
	642	210 - 540	ECR334 DWR450 AW3350	181	595	20,9	65	792 0688

Combinations

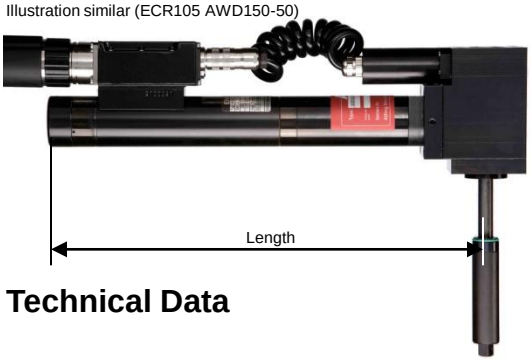
Design with reaction torque sensor



Built-In Nutrunner Size 3 – Angle Drive

E 1.3.3

Illustration similar (ECR105 AWD150-50)



Size 3

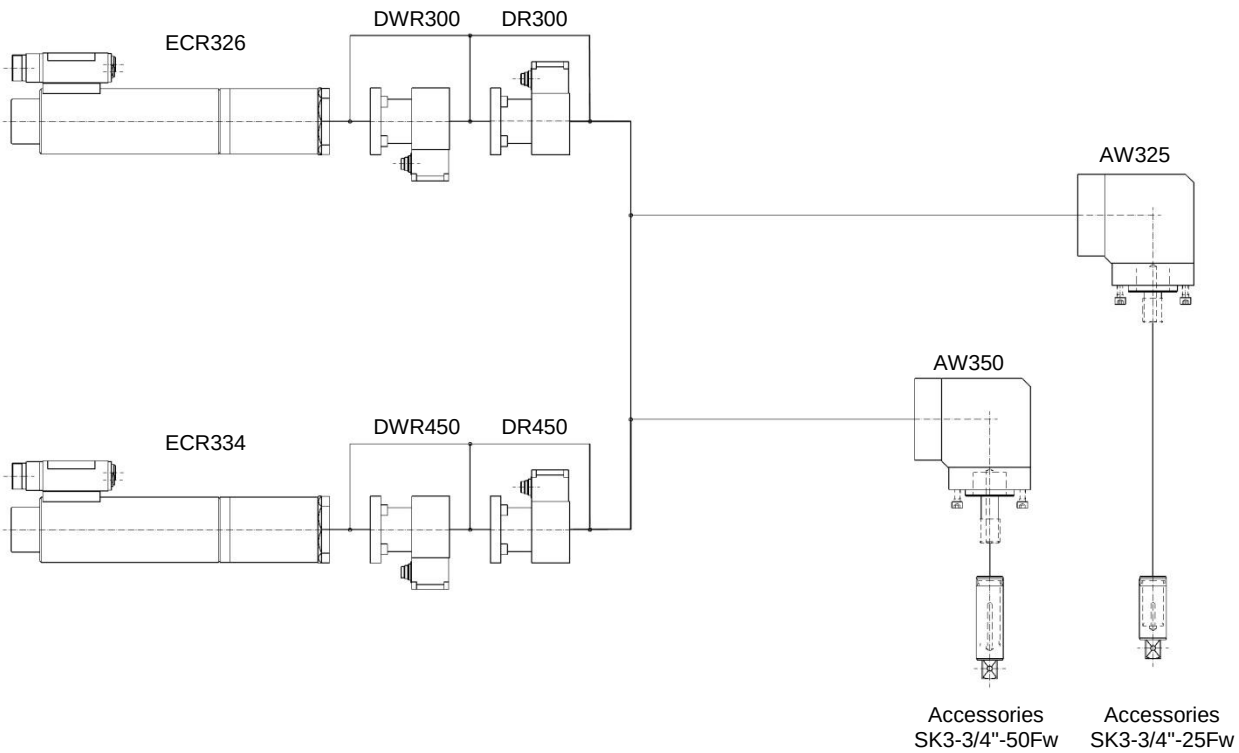
25 Nm up to 642 Nm

Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with reaction torque sensor							
C	247	50 - 222	ECR326 DR300 AW325	470	579	15,7	65	792 0507
	247	50 - 222	ECR326 DR300 AW350	470	579	16,1	65	792 0508
	321	60 - 270	ECR334 DR450 AW325	362	579	18,9	65	792 0509
	321	60 - 270	ECR334 DR450 AW350	362	579	19,3	65	792 0510
	495	99 - 445	ECR326 DR300 AW3325	235	595	17,6	65	792 0551
	495	99 - 445	ECR326 DR300 AW3350	235	595	17,6	65	792 0552
	642	120 - 540	ECR334 DR450 AW3325	181	595	20,8	65	792 0553
	642	120 - 540	ECR334 DR450 AW3350	181	595	20,8	65	792 0554
	Built-in nutrunner with two reaction torque sensors							
D	247	50 - 222	ECR326 DWR300 DR300 AW325	470	676	18,4	65	792 0523
	247	50 - 222	ECR326 DWR300 DR300 AW350	470	676	18,8	65	792 0524
	321	60 - 270	ECR334 DWR450 DR450 AW325	362	676	21,6	65	792 0525
	321	60 - 270	ECR334 DWR450 DR450 AW350	362	676	22,0	65	792 0526
	495	99 - 445	ECR326 DWR300 DR300 AW3325	235	692	20,2	65	792 0557
	495	99 - 445	ECR326 DWR300 DR300 AW3350	235	692	20,2	65	792 0558
	642	120 - 540	ECR334 DWR450 DR450 AW3325	181	692	23,4	65	792 0559
	642	120 - 540	ECR334 DWR450 DR450 AW3350	181	692	23,4	65	792 0560

Combinations

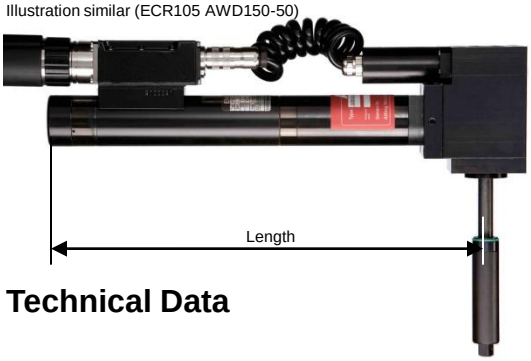
Design with reaction torque sensor



Built-In Nutrunner Size 3 – Angle Drive

E 1.3.3

Illustration similar (ECR105 AWD150-50)



Size 3

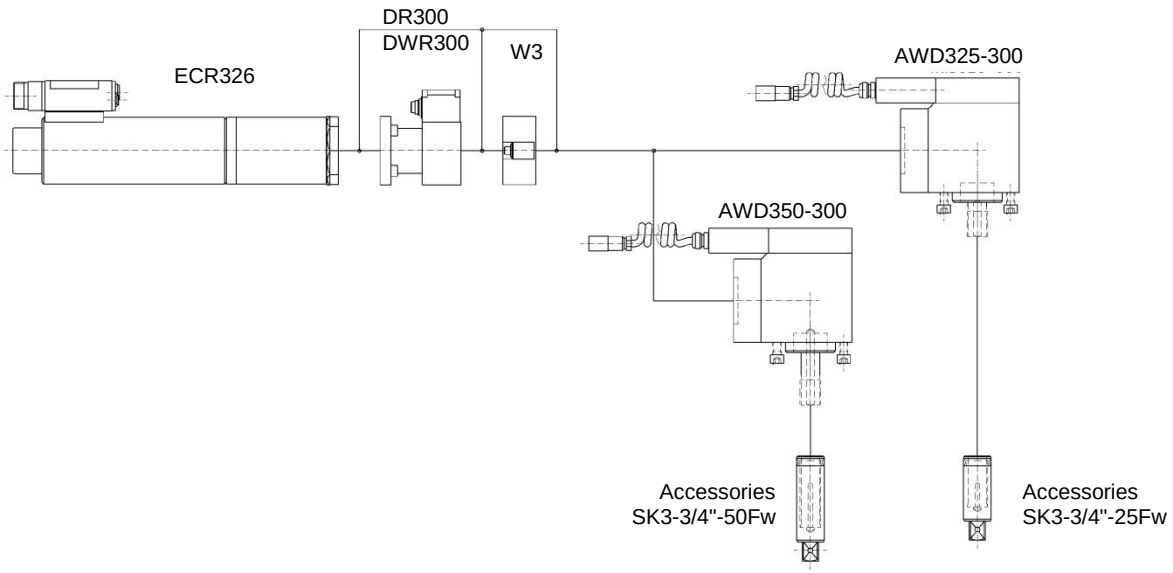
25 Nm up to 642 Nm

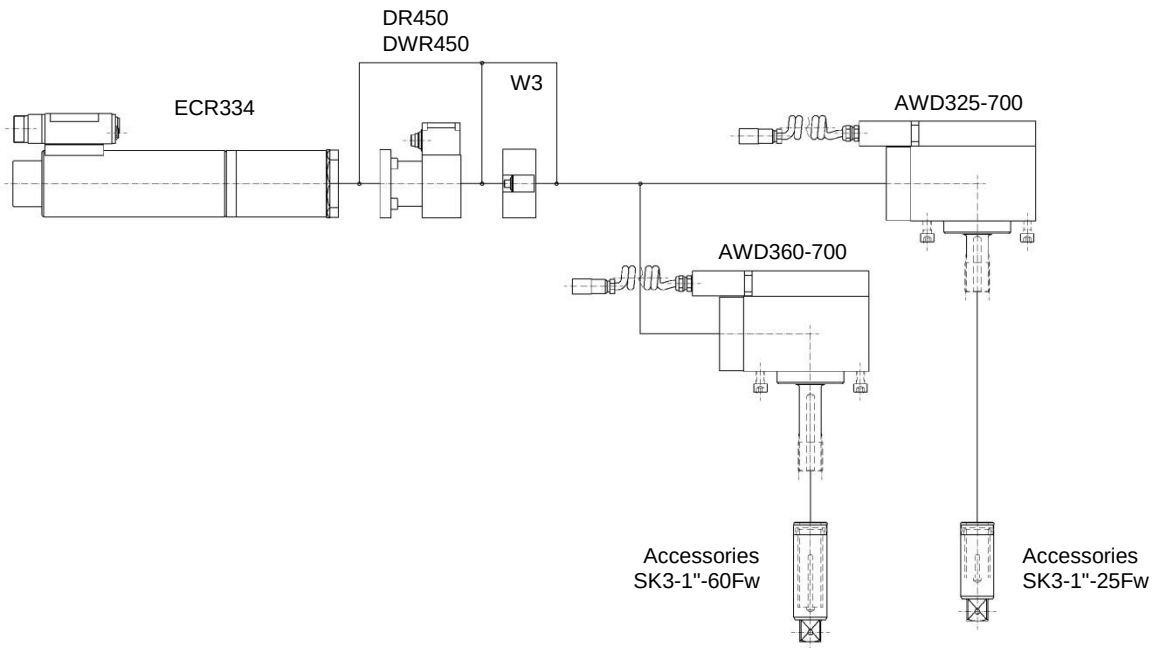
Technical Data

	Max. torque capacity in Nm	Torque range Nm	Type	Max. idle speed rpm	Length mm	Weight kg	Sound Level db (A)	Ident-No.
	Built-in nutrunner with action torque sensor							
E	247	25 - 222	ECR326 AWD325-300	470	482	14,3	65	792 0356
	247	25 - 222	ECR326 AWD350-300	470	482	14,5	65	792 0357
	642	60 - 540	ECR334 AWD325-700	181	499	18,6	65	792 0358
	642	60 - 540	ECR334 AWD360-700	181	499	18,9	65	792 0359
	Built-in nutrunner with action torque sensor and angle encoder							
F	247	25 - 222	ECR326 W3 AWD325-300	470	521	14,9	65	792 0360
	247	25 - 222	ECR326 W3 AWD350-300	470	521	15,1	65	792 0361
	642	60 - 540	ECR334 W3 AWD325-700	181	538	19,2	65	792 0362
	642	60 - 540	ECR334 W3 AWD360-700	181	538	19,5	65	792 0363
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
G	247	25 - 222	ECR326 DWR300 AWD325-300	470	579	16,9	65	792 0364
	247	25 - 222	ECR326 DWR300 AWD350-300	470	579	17,1	65	792 0365
	642	60 - 540	ECR334 DWR450 AWD325-700	181	596	21,5	65	792 0366
	642	60 - 540	ECR334 DWR450 AWD360-700	181	596	21,8	65	792 0367
	Built-in nutrunner with redundant design							
H	247	25 - 222	ECR326 DR300 W3 AWD325-300	470	618	17,5	65	792 0540
	247	25 - 222	ECR326 DR300 W3 AWD350-300	470	618	17,7	65	792 0541
	642	60 - 540	ECR334 DR450 W3 AWD325-700	181	635	22,1	65	792 0542
	642	60 - 540	ECR334 DR450 W3 AWD360-700	181	635	22,4	65	792 0543
	Built-in nutrunner with torque sensor for calibration (action torque sensor and reaction torque sensor)							
I	247	25 - 222	ECR326 DWR300 W3 AWD325-300	470	618	17,5	65	792 0368
	247	25 - 222	ECR326 DWR300 W3 AWD350-300	470	618	17,7	65	792 0369
	642	60 - 540	ECR334 DWR450 W3 AWD325-700	181	635	22,1	65	792 0370
	642	60 - 540	ECR334 DWR450 W3 AWD360-700	181	635	22,4	65	792 0371

Combinations

Design with action torque sensor





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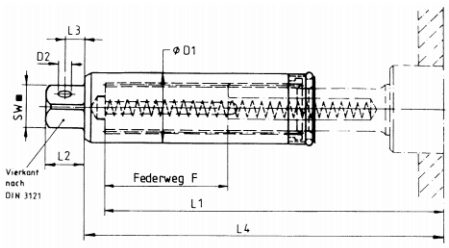
Socket Adaptors for Straight Nutrunner

E 1.4

Standard Socket Adaptors with 25mm und 50mm Spring Travel and External Square Drive

Technical Data



	Socket Type	Suitable for drive	Drive □	Spring travel mm	Spring resistance min/max N	D1 mm	D2 mm	L1 mm	L2 mm	L3 mm	L4 mm	Max. Md Nm	Ident-No.
Size 1	SK-1	AZ125	3/8"	25	15 - 33	22	3,5	103	10,4	5,6	110	63	700 2387
		AO125						103			110		
		AW125						70			77		
		AOD125-...						103			110		
		AWD125-...						85			92		
		AZ150		50	12 - 30			153			160		700 2230
		AO150						153			160		
		AW150						120			127		
		AOD150-...						153			160		
		AWD150-...						110			117		
Size 2	SK-2	AZ225	1/2"	25	20 - 30	28	4,5	116	15,5	8,0	130	165	700 2413
		AO225						116			130		
		AW225						52			91		
		AOD225-...						116			130		
		AWD225-...						91			105		
		AZ250		50	20 - 40			166			180		700 2049
		AO250						166			180		
		AW250						127			141		
		AOD250-...						166			180		
		AWD250-...						141			155		
		AZ250	5/8"	50	20 - 40	28	4,5	166	16,1	8,0	177	300	700 4768
		AO250						166			177		
		AW250						127			138		
		AOD250-...						166			177		
		AWD250-...						141			152		
Size 3	SK-3	AZ325	3/4"	25	20 - 30	33	6,0	118	23	10,2	135	560	700 2404
		AO325						118			135		
		AW325						71			88		
		AOD325-300						118			135		
		AOD325-450						118			135		
		AWD325-300						78			95		
		AZ350		50	20 - 40			168			185		700 2133
		AO350						168			185		
		AW350						116			133		
		AOD350-300						168			185		
		AOD350-450						168			185		
		AWD350-300						125			142		
		AOD325-800	1"	25	40 - 80	40	6,0	120	26,5	15,2	145	1200	700 6175
		AOD325-1000						121			146		
		AWD325-700						110			135		
		AOD360-800		60				170			195		700 6176
		AOD360-1000						170			195		
		AWD360-700						160			185		
Sz. 4	SK-4	AZ480	1"	80	30 - 80	55	6,0	262	26,5	15,2	282	1200	700 2956

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Transverse Gearbox

E 1.5

Q - Gearbox

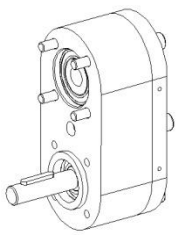
General Information

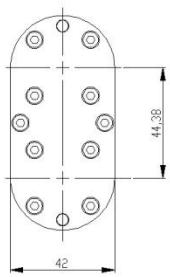
By redirecting the drive line over a transverse gearbox, the length of the spindle can be reduced considerably. The power is transferred over three gears. The model-dependent transmission ratio, as well as efficiency, must be considered separately when configuring the complete nutrunner.

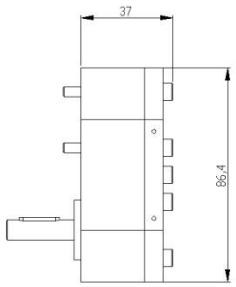
Please contact us for detailed information about built-in nutrunners with transverse gearboxes.

Q1 - Gearbox

Ident-No.: 700 4533

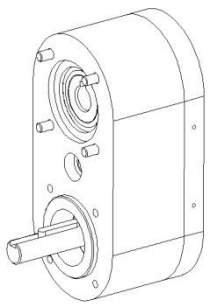


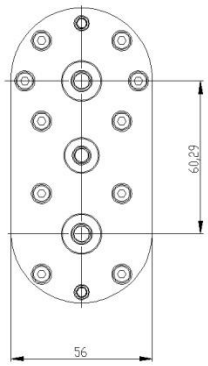


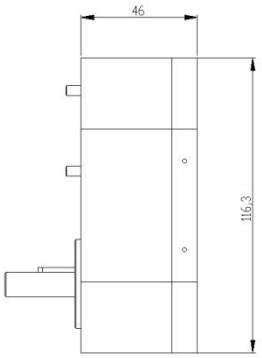


Q2 - Gearbox

Ident-No.: 700 3087

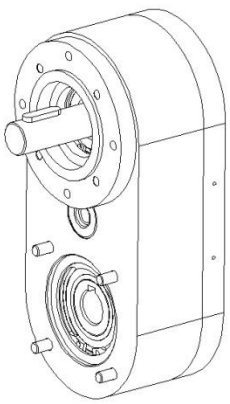


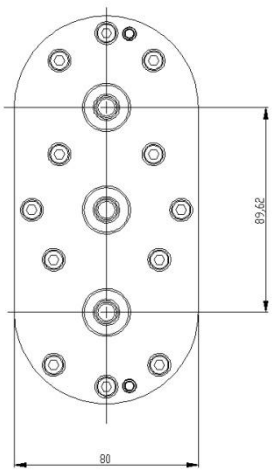


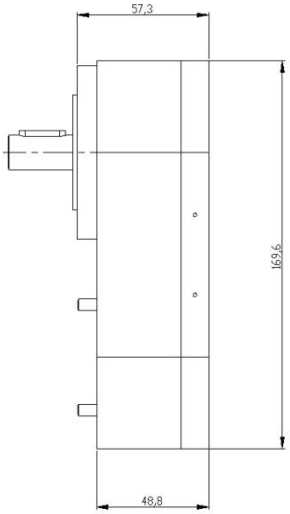


Q3 - Gearbox

Ident-No.: 700 3153







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Adapter

A - Adapter

General Information

If two data sensors are implemented in a series (e.g., for a redundant system or calibration with external gauge), then the cable connections are opposite each other. Due to space requirements or installation location, it might be necessary to locate the cable connectors on top of each other. The A adapter module is designed for this purpose.

Type	Ident-No.
A1 Adapter Size 1	700 6332
A2 Adapter Size 2	700 6333
A3 Adapter Size 3	700 6334

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Nutrunner Cable

E 1.7

Tool Cable for Built-In Nutrunners

Available Cable

Cable configurations are available for:

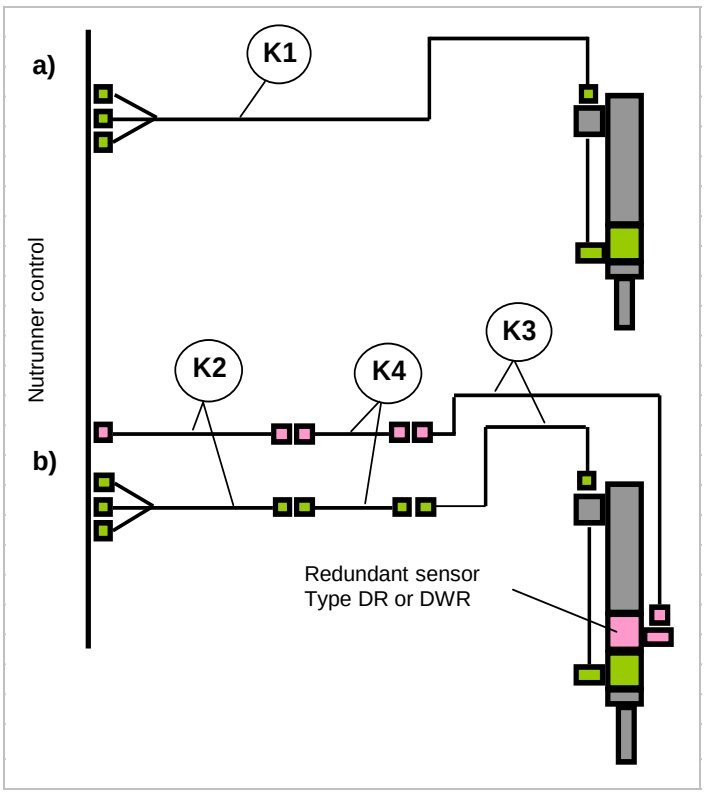
a) Nutrunner configurations with Series DR or DA / DWA data sensors

b) Redundant sensors from Series DR or DWR

Nutrunners without data sensors use the same cable as used with Series DR sensors.

Cable Quality:

Flexible = for fixed placement
Highly flexible = suitable for cable track
Max. flexible = suitable for robotics



				Cable for Nutrunner			Cable for Redundant Sensor		
Cable Type	**Suitable for Sensors**	**Cable Quality (see above)**	**Outlet on Nutrunner Side**	**Ident-No.**	**Ø in mm**	**Bend Radius in mm**	**Ident-No.**	**Ø in mm**	**Bend Radius in mm**
K1	DR / DWR	highly flexible	straight	7079050	17	255	on request		
			angle 90°	7079059					
		max. flexible	straight	on request	15	150	on request		
			angle 90°	on request					
	DA / DWA	highly flexible	straight	7079052	17	255			
			angle 90°	7079085					
		max. flexible	straight	on request	15	150			
			angle 90°	on request					
K2	DR / DWR	flexible	not relevant				7079064	8,5	127,5
	DA / DWA	highly flexible		7079050	17	255			
				7079052					
K3	DR / DWR DA / DWA	highly flexible	straight	7079051					
			angle 90°	7079053					
		max. flexible	straight	7079054	15	150	7079061	8	120
			angle 90°	7079066					
K4	DR / DWR	highly flexible	not relevant	7079051	17	255			
	DA / DWA	max. flexible		7079054	15	150	7079061	8	120

Cable length must be indicated at time of order.

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HIGH POWER Nutrunner Controls

E 1.8

Control Systems for Built-In Nutrunners

AMT offers a broad spectrum of nutrunner controls, which were developed as a result of diversified requirements from our customer base. A modular systems architecture provides custom solutions for even the most complex demands.

AMT is defining new benchmarks with these control systems. Thanks to an integrated PC, there are almost no limits in regard to the nutrunning process, network capabilities, and integration with higher level host computers and quality management systems. The modular software architecture on the SMXP makes it possible to adapt control software to just about any application. And what if the software, despite its powerful range of functions, still doesn‘t meet your needs? No problem! Our strength lies in developing individual software solutions for customer requirements, building on our tried and true base software.

Our control systems are distinguished by their modular and open system architecture. The use of PC technology, in connection with a Windows operating system, offer almost unlimited expansion possibilities. Up to 64 nutrunner channels can be controlled from a single Master PC. High-channel control systems are installed, for cost and space reasons, in electrical cabinets.

It only stands to reason that all of the data stored by our nutrunner controls can be made available over network interfaces to higher order computer systems for post-processing.

SMX30
for single-channel applications

SMX30 SMX10
for multi-channel applications

SMXP
for single-channel applications

SMXP twin
for multi-channel applications

SMX30 mc-c
for 1-6 channel applications

SMXP
for 1-64 channel applications

Nutrunner Control SMX30

Single-Channel

E 1.8.1

General Information

High-end control in compact design

The SMX30 is the natural advancement to our successful SMXP high-end nutrunner control. By using a PC in 3.5" format, the size of the control is significantly reduced in size – while maintaining the same range of functions!

Quality assurance documentation

Rundown results and graphs can be stored locally or uploaded to a host computer.

Flexibility through integrated PC

An integrated PC expands SMX30 functionality considerably, when compared to conventional controls. For example, it allows you to establish a direct connection to your host computer.

The operating system, programs, and system data are stored on a write-protect Compact-Flash card, with temporary data stored on a second Compact-Flash card. The operating system, Windows XP Embedded, is condensed to provide only the necessary functions, while offering maximum protection against network virus attacks.

Fastening case analysis

A user-friendly operator interface is available for analyzing fastening cases. Up to 999 fastening curves can be displayed and stored for later evaluation. This display is activated by date and time, as well as a value for the number of fastening curves requested. The displayed curves can be scanned and zoomed, as needed. For further analysis, up to 99 curves can be overlaid so that the intersection of each curve can be placed on the swell torque.

Programming complex nutrunning processes

The SMX30 offers programming capabilities for complex nutrunning processes. All torque and angle-based algorithms are available as base modules. These modules, along with additional commands for process control, can be linked with a user-friendly parameter software to create complex nutrunning processes. Conditional program statements can be based on rundown results, which enable, for example, loosening operations with or without repeated nutrunning. In addition, the control offers advanced nutrunning and monitoring processes, such as yield control, retrospective nutrunning monitor, and friction measurement.

Operation, configuration and display

A 6.5" touch-screen display facilitates the operation, configration and graphic interface.

Automatic tool identification

Tools from AMT are equipped with data storage, in which all tool-specific parameters are stored. When the tool is connected to the SMX30 control, this data is read and compared with the archived data stored on the control.

If these data do not agree, then the tool is not accepted by the control, and a fault message is issued. If the operator acknowledges the situation manually, the new data can be transferred.

Nutrunner Control SMX30

Single-Channel

E 1.8.1

General Information

Nutrunner Data Management

The SMX30 stores nutrunner data on the local Compact-Flash card to monitor the quality of the nutrunning process. Integrated statistical functions make it possible to evaluate the stored torque and angle values and report the actual cm- and cmk values. If desired, the data can be stored for up to 12 months on the hard drive. This data can also be exported into Excel.

Local nutrunning network configurations

It is possible to create a local, cost-effective nutrunning network with the SMX30. Up to 63 SMX10 nutrunner controls can be linked via bus-system to an SMX30. The SMX30 also functions in this case as a master control, communicating with customer systems, e.g., conveyor control system or host computer, and coordinates all connected SMX10 slaves.

Access Restriction by User Groups

A key factor in securing the nutrunning process is the protection of the nutrunner control from unauthorized access. Frequently, only a limited number of employees are allowed to modify the nutrunning parameters. The SMXP is capable of managing an access hierarchy with up to 5 user groups. Authorization is password-protected.

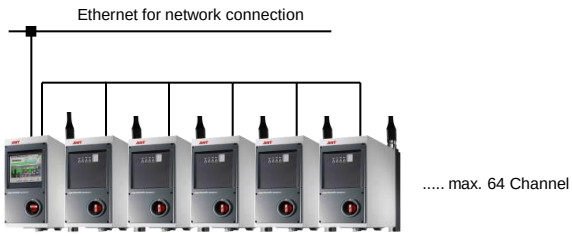
Integrated task management

When a single work station requires several nutrunning operations to be executed, the SMX30 offers the possibility to define up to 31 different nutrunning programs in one task plan. These can be carried out automatically or with guidance. The SMX30 counts and monitors whether all processes have been completed and creates a total quality assessment at the end. Task plans are stored either locally or uploaded from the SMX30 to your host computer.

Enhanced Process Control

The SMX30 is often used for quality-critical nutrunning applications, where the fastening process is accompanied by additional process control measures. One example for this would be the recognition of nutrunning locations by ultrasonic triangulation. It is possible with this process to have an automatic correlation between the tightening parameters and the actual values for each fastener. The software required for this is simply installed on the integrated PC.

Ask us about more process control possibilities!



Nutrunner Control SMX30

E 1.8.1

Single-Channel

Special Features - Technical Data

Assembly
- Four assembly mounting holes in wall console
- IP54 protection

Display and Operator Controls
- 6.5” touch-screen display

Programming und Parameter Definition
- User-friendly programming software via network

Nutrunning Processes
- Torque-controlled tightening
- Torque-controlled with angle monitor
- Angle-controlled with torque monitor
- Yield-controlled tightening
- Angle-controlled and torque-controlled loosening
- Shutdown based on digital signal with torque and angle control
- Friction measurement
- Retrospective nutrunning monitor
- Redundant motor current control
- Nutrunning time monitor

Interfaces
- 2 x Ethernet
- RS232, RS485
- USB
- Field bus systems available with expansion cards (optional)

Peripheral Equipment
- Operator console
- Socket tray
- Signalers (e.g., stacklight, alarm horn, etc.)
- I/O modules (parallel)
- Barcode reader, read/write devices (e.g., Moby E)

Number of Programs
- Max. 31

Spindle Types
- Hand tools from HCR, HCRK, PCR, HCX and PCX series with reaction torque sensors or action torque sensors
- Built-in tools from ECR1 and ECR2 series with with reaction torque sensors or action torque sensors

Enhanced Functions
- Part-based OK / fault information using counter function (available for multiple programs of different tightening groups)
- Interface to part-based nominal data defaults from host computer
- Tightening data transfer to higher level systems
- Tightening location recognition (e.g. by ultrasound triangulation, iTeleskop)
- Load-dependent maintenance management for carrying out preventive maintenance on tools
- Integration in our RailNet system for wireless power supply and positioning of nutrunner control on assembly line
- Centralized parameter management

Nutrunner Control SMX30

E 1.8.1

Single-Channel

Overview Nutrunner Controls SMX30

Designation code:

SMX30 40ASH 02 EA

SMX = Designation nutrunner control generation

30 = Nutrunner control type

40A = Power class of output stage

SH = Internal designation

02 = Version number

EA = Parallel I/O interface

- IBS = Interbus Slave interface
- IBM = Interbus Master interface
- PBS = Profibus Slave interface
- DNS = Device Net Slave interface
- WLAN = Integrated WLAN card

Further interfaces on request

Type	Dimensions control (HxWxD) in mm	Dimensions wall console (HxWxD) in mm	Total dimensions (HxWxD) in mm	Weight in kg	Ident-No.
SMX30 40ASH 02	330x180x316	330x180x63	330x180x379	approx.12,5	700 9939
SMX30 40ASH 02 EA	330x180x316	330x180x63	330x180x379	approx.12,5	700 9955
SMX30 40ASH 02 IBS	330x180x316	330x180x63	330x180x379	approx.12,5	700 9956
SMX30 40ASH 02 IBM	330x180x316	330x180x63	330x180x379	approx.12,5	700 9957
SMX30 40ASH 02 PBS	330x180x316	330x180x63	330x180x379	approx.12,5	700 9958
SMX30 40ASH 02 DNS	330x180x316	330x180x63	330x180x379	approx.12,5	700 9959
SMX30 40ASH 02 WLAN	330x180x316	330x180x63	330x180x379	approx.12,5	700 11606
SMX30 40ASH 02 EA WLAN	330x180x316	330x180x63	330x180x379	approx.12,5	700 11607

Nutrunner Control SMX10

E 1.8.2

Single-Channel

General Information

Most cost-effective control for documentdriven fastening applications

The SMX10 offers the same nutrunning features as the Master control (SMX20, SMX30, SMXP), without an integrated PC.It was developed especially for use in networks and is generally driven as a “slave” component. A internal bus-system (Ident-No. 700 9937) provides communication capabilities with a AMT Master control (SMX20, SMX30, SMXP). An Ethernet interface (Ident-No. 700 9943) provides communication capabilities with a plant’s master control (e.g., PC) or an SMX30.

In slave mode, the SMX10 receives program requirements from a master, based on target data that is either stored locally or downloaded from a host computer. These are then processed by the SMX10 in a self-sufficient manner. After each fastening operation, rundown results and graphs are reported back to the master.

Enhanced nutrunning and monitoring processes

The SMX10 offers programming capabilitiesfor complex nutrunning processes. All torque and angle-controlled algorithms are available as base modules. These modules, along with additional commands for process control, can be linked to create complex nutrunning processes. Conditional program statements can be based on rundown results, which enable, for example, loosening operations with or without repeated nutrunning. In addition, the control offers advanced nutrunning and monitoring processes, such as yield control, retrospective nutrunning monitor, and friction measurement. The SMX10 can be programmed with a userfriendly interface that resides on a laptop or master-PC.

Manual operation

Manual operation mode is available with the SMX10 nutrunner control for operation without a master. The control functions in this mode without communication to a master control. This means that it is not possible to form overall part-based quality assessments. Programs are determined by a program selector switch on the operator panel or by a socket tray. If only one program is required, then this can also be permanently set.

Rundown results are stored locally on the nutrunner control in this mode and uploaded to the master control after reconnection. If parts are identified by a barcode reader, then the part number is also assigned to rundown results in this operating mode.

Nutrunner Control SMX10

E 1.8.2

Single-Channel

Special Features - Technical Data

Assembly
- Housing brackets for wall / mounting on support element
- IP54 protection

Display and Operator Controls
- 7-digit display for status and error messages
- 4 LEDs to display individual nutrunning and operational status

Programming und Parameter Definition
- User-friendly programming software via network

Nutrunning Processes
- Torque-controlled tightening
- Torque-controlled with angle monitor
- Angle-controlled with torque monitor
- Yield-controlled tightening
- Angle-controlled and torque-controlled loosening
- Shutdown based on digital signal with torque and angle monitor
- Friction measurement
- Retrospective nutrunning monitor
- Redundant motor current control
- Nutrunning time monitor

Interfaces
- Serial interface for barcode reader
- Parallel I/O
- Ethernet

Peripheral Equipment
- Operator console
- Socket tray
- Barcode reader

Number of Programs
Slave mode
- max. 31 tightening programs and 1 loosening program

Manual operation
- 1 program without operator console or socket tray
- max. 8 tightening programs with socket tray
- max. 15 tightening programs with operator console
- with program selection switch
- 1 loosening program

Spindle Types
- Hand tools from HCR, HCRK, PCR, HCX and PCX series with reaction torque sensors or action torque sensors
- Built-in tools from ECR1 and ECR2 series with with reaction torque sensors or action torque sensors

Type	Dimensions control (HxWxD) in mm	Dimensions wall console (HxWxD) in mm	Total dimensions (HxWxD) in mm	Weight in kg	Ident-No.
SMX10 40ASH 02	330x180x316	330x180x63	330x180x379	approx.12,5	700 9937
SMX10 40ASH 02 ETH*	330x180x316	330x180x63	330x180x379	approx.12,5	700 9943

* Version ETH (Ethernet) only in connection with a Master PC to be made available by the customer.

Nutrunner Control SMX30 mc-c

1-6 Channel

E 1.8.3

General Information

Compact control system

Our primary goal in developing the SMX30 mc–c (multi-channel compact) was the integration of our highest-performance nutrunner control with a design that is cost-efficient and requires minimal space.

The SMX30 mc–c has made it possible for us to reduce the space requirement by over 30% when compared with a configuration made up of individual modules.

The control system is completely assembled and tested by AMT prior to delivery. All that is left for the customer to do is to mount the housing on 2 anchorage points, plug it in, and turn it on – done! It's hard to imagine a more cost-efficient system integration. The configuration of the control system in a compact housing is – compared to electrical cabinet solutions or systems with individual modules – considerably more economical.

The SMX30 mc–c consists of a Master-PC and up to 6 nutrunner modules. Additional SMX30 mc–c controls can be linked together, without additional Master- PC, to achieve up to 64 nutrunner channels. The Master-PC coordinates the connected nutrunner modules over an internal system bus and can communicate with other customer-provided systems, such as a conveyor control or host computer. The operating system, programs, and systems data are stored on a write-protected Compact Flash card, with temporary data stored on a second flash card. The Windows XP Embedded operating system has been reduced to only necessary functions in order to provide a maximum in anti-virus protection in case of network integration.

A 6.5-inch touch screen or laptop can be used for operation and display of the user-friendly parameterized program. All nutrunner results are reported back to the Master-PC from the nutrunner modules and linked together for a total evaluation.

Installation-friendly multichannel, compact

The SMX30 mc–c is installation-friendly and simplifies assembly and maintenance.

It consists of a metal housing with a large door opening on the right side. If service is required, individual nutrunner modules can be replaced very quickly. It is no longer necessary to replace the complete nutrunner system, as with competitive equipment. Only the defective parts have to be replaced. This results in considerable reductions in maintenance and repair costs.

Programming complex nutrunning processes

The SMX30 mc–c offer programming capabilities for complex nutrunning processes.

All torque- and angle-based algorithms are available as base modules. Linked nutrunners can be controlled in synchronous, time-delayed, or group-oriented operation. Conditional program statements can be based on rundown results, which enables, for example, loosening operations with or without repeated nutrunning. In addition, the control offers advanced nutrunning and monitoring processes, such as yield control, retrospective nutrunning monitor, and friction measurement.

User-friendly programming system

Processes are programmed with the aid of a user-friendly programming system. Nutrunning algorithms and start commands are stored in a library. These elements can be combined, using a "drag and drop" method, for part-specific sequences and parameterization.

Nutrunner Control SMX30 mc-c

1-6 Channel

E 1.8.3

Special Features - Technical Data

Interfaces
• The SMX30 mc–c communication possibilities afforded by the integrated PC, are almost unlimited. Available interfaces include Ethernet, field bus, RS232, RS485, and USB. Additional interfaces are available with expansion cards.

General
• Mini-PC, 1GHz
• Windows XP Embedded
• Operating system, system programs, and data on removable CompactFlash card

Assembly / Dimensions
• Wall assembly
• Schutzart IP54
• Control dimensions 760mmx600mmx360mm (HxWxD)

Display and Operator Controls
• 6,5" touch-screen display

Programming and Parameterization
• Directly via 6,5" touch-screen display
• User-friendly programming software via laptop or network
• Via external mouse and keyboard

Nutrunning Processes
• Torque-controlled tightening
• Torque-controlled with angle monitor
• Angle-controlled with torque monitor
• Yield-controlled tightening
• Angle-controlled and torque-controlled loosening
• Shutdown based on digital signal with torque and angle control
• Friction measurement
• Retrospective nutrunning monitor
• Redundant motor current control
• Nutrunning time monitor

Interfaces
• Ethernet
• USB
• Field bus systems available with expansion cards (optional)
• RS232, RS485
• Parallel I/O

Number of Programs
• Max. 31 programs per nutrunning group

Expanded Functions
• Time-independent nutrunner operation in max. 8 groups
• Transfer of nutrunning data
• Interface for redundant gauge sensor
• Load-dependent spindle maintenance management

Power Supply
• 400V / 50Hz; 3 Phasen, N, PE

Nutrunner Models
• Built-in tools from ECR Series with reaction torque sensors and action torque sensors

Nutrunner Control SMXP

E 1.8.4

Single-Channel – Multi-Channel

General Information

High-End Nutrunner Control

The SMXP is our high-end nutrunner control that can take on other tasks in addition to the nutrunning process. For this purpose, the SMXP uses an efficient, industrial PC, including an operator panel with color monitor.

Programming Complex Nutrunning Sequences

The SMXP offers, as opposed to traditional nutrunner controls, the possibility of programming complex nutrunning sequences. All standard nutrunning processes that are based on torque and angle-based are available as program modules. These basic modules, as well as additional commands for process control, can be combined, with the aid of a user-friendly, parameter-driven interface, to form complex nutrunning sequences. Program branches can be written that are executed as a result of quality information, that, for example, allow loosening operations with or without repeated nutrunning.

Nutrunning Case Analyses

A user-friendly graphic interface is available for conducting nutrunning case analyses. Up to 999 nutrunning curves can be drawn and stored for evaluation at a later time. Graph activitation occurs by date and time, as well as by inputting the number of desired nutrunning curves. The resulting nutrunning curve can be panned and zoomed in, as needed. For further analysis, it is possible to overlay up to 99 nutrunning curves, where the intersection of each curve can be positioned on the threshold torque.

Automatic Tool ID

Handheld nutrunners from AMT are equipped with a data storage feature, in which all tool-related parameters can be stored. When a tool is connected to the SMXP, these parameters are automatically retrieved and can be compared with nominal data stored in the control. If the data do not match, then the tool will not be accepted by the control and a fault message will be generated. Acceptance of new data and start of operation can only occur in this case if the data is confirmed by manual intervention.

Integrated work plan management for multiple nutrunner channels (nutrunner controls)

For multiple fastening operations with different tools at a single work station, the SMXP offers the ability to define up to 31 different fastening programs per tool in a work plan. These can then be executed in free-style or guided operation. The SMXP counts and monitors whether all fastening operations have been completed and creates a total quality evaluation on the end of the process. Work plans are either stored locally or transferred from a customer-provided host computer.

SMXP
Single-Channel

SMXP twin
Multi-Channel

SMXP Multi-Channel
1-64 Channel

Nutrunner Control SMXP

Single-Channel – Multi-Channel

E 1.8.4

General Information

Nutrunner Data Management

The SMXP stores nutrunner data on the local hard drive to monitor the quality of the nutrunning process. Integrated statistical functions allow evaluation of the stored torque and angle values with specification of the actual cm- and cmk-values. If desired, the data can be stored for up to 12 months on the hard drive. The data can also be exported into an Excel spreadsheet file.

Quality Documentation

Nutrunner results and graphs can be stored locally or transmitted to higher-order computer systems.

Access Restriction by User Groups

A key factor in securing the nutrunning process is the protection of the nutrunner control from unauthorized access. Frequently, only a limited number of employees are allowed to modify the nutrunning parameters. The SMXP is capable of managing an access hierarchy with up to 5 user groups. Authorization is password-protected.

Enhanced Process Control

The SMXP is often used for quality-critical nutrunning applications, where the fastening process is accompanied by additional process control measures. One example for this would be the recognition of nutrunning locations by ultrasonic triangulation.
It is possible with this process to have an automatic correlation between the tightening parameters and the actual values for each fastener. The software required for this is simply installed on the integrated PC.
Ask us about more process control possibilities!

Multi-Channel Configuration

The capabilities of the SMXP allow the configuration of multi-channel controls

- **Centralized Configuration**
  Master PC and graphic display unit, as well as up to 10 nutrunner modules, are installed in a control cabinet. As required, the control cabinet can then be either positioned near the workstation area or on a control cabinet platform.

Interfaces

The communication possibilities available with the Master PC are almost unlimited. Available interfaces include Ethernet, fieldbus, RS232, RS485, and USB. Expansion boards can be used to implement additional interfaces.

Nutrunner Control SMXP

E 1.8.5

Single-Channel

Special Features - Technical Data

General
- Pentium processor
- Operating system: Windows XP Professional
- 8 GB hard drive and 3.5“/1.44 MB floppy disk drives
- 10/100 Mbit Ethernet interface, RJ45 network connector (e.g. for programming, nutrunner data transfer, etc.)
- Serial interface (e.g. for ID system, barcode reader, label printer, etc.)
- LPT1 printer interface
- USB printer interface
- USB interface for data backup

Assembly / Dimensions
- Mounting: bracket for wall / ceiling or mounting on support element
- Dimensions: 630mm x 510mm x 260mm (HxWxD)
- Protection: IP54

Display and Operator Controls
- TFT 15“ color monitor
- Full keyboard with mouse

Programming and Parameterization
- Integrated operator and parameter interface
- Via network

Nutrunning Processes
- Torque-controlled tightening
- Torque-controlled with angle monitor
- Angle-controlled with torque monitor
- Yield-controlled tightening
- Angle-controlled and torque-controlled loosening
- Shutdown based on digital signal with torque and angle control
- Friction measurement
- Retrospective nutrunning monitor
- Redundant motor current control
- Nutrunning time monitor

Periphery
- Operator control
- Socket box
- Indicators (e.g. lights, horn, sector division, etc.)
- Signal exchange with SPS:
  - I/O modules (parallel)
  - Field bus (e.g. Profibus, Interbus, DeviceNet, etc.)
- Barcode reader, data media (e.g. Moby E)

Number of Programs
- Max. 31 per tool (depends on the selection)

Enhanced Functions
- Part-based OK / fault information using counter function (available for multiple programs)
- Interface to part-based nominal data defaults from host computer
- Tightening data transfer to higher level systems
- Tightening location recognition (e.g. by ultrasound triangulation)
- Load-dependent maintenance management for carrying out preventive maintenance on tools
- Integration in our RailNet system for wireless power supply and positioning of nutrunner control on assembly line
- Centralized parameter management

Power Supply
- SMXP single-channel housing: 230V / 50Hz

Compatible Nutrunner Models
- Hand tools from HCR, HCRK, PCR, HCX and PCX series with reaction torque sensors or action torque sensors
- Built-in tools from ECR1 and ECR2 series with reaction torque sensors or action torque sensors, as long as emergency stop is not required

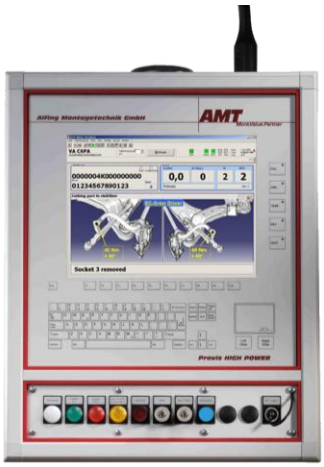
Type	Dimensions (BxHxT) in mm	Weight in kg	Ident-No.
Nutrunner control SMXP	630x510x260	approx. 40	on request

Nutrunner Control SMXP twin

E 1.8.6

2-Channel

Special Features - Technical Data



General
- Pentium processor
- Operating system: Windows XP Professional
- 8 GB hard drive and 3.5“/1.44 MB floppy disk drives
- 10/100 Mbit Ethernet interface, RJ45 network connector (e.g. for programming, nutrunner data transfer, etc.)
- Serial interface (e.g. for ID system, barcode reader, label printer, etc.)
- LPT1 printer interface
- USB printer interface
- USB interface for data backup

Assembly / Dimensions
- Mounting: bracket for wall / ceiling or mounting on support element
- Dimensions: 630mm x 510mm x 415mm (HxWxD)
- Protection: IP54

Display and Operator Controls
- TFT 15“ color monitor
- Full keyboard with mouse

Programming and Parameterization
- Integrated operator and parameter interface
- Via network

Nutrunning Processes
- Torque-controlled tightening
- Torque-controlled with angle monitor
- Angle-controlled with torque monitor
- Yield-controlled tightening
- Angle-controlled and torque-controlled loosening
- Shutdown based on digital signal with torque and angle control
- Friction measurement
- Retrospective nutrunning monitor
- Redundant motor current control
- Nutrunning time monitor

Periphery
- Operator control
- Socket box
- Indicators (e.g. lights, horn, sector division, etc.)
- Signal exchange with SPS:
  - I/O modules (parallel)
  - Field bus (e.g. Profibus, Interbus, DeviceNet, etc.)
- Barcode reader, data media (e.g. Moby E)

Number of Programs
- Max. 31 per tool (depends on the selection)

Enhanced Functions
- Part-based OK / fault information using counter function (available for multiple programs)
- Interface to part-based nominal data defaults from host computer
- Tightening data transfer to higher level systems
- Tightening location recognition (e.g. by ultrasound triangulation)
- Load-dependent maintenance management for carrying out preventive maintenance on tools
- Integration in our RailNet system for wireless power supply and positioning of nutrunner control on assembly line
- Centralized parameter management

Power Supply
- SMXP multi-channel housing: 230V / 50Hz

Compatible Nutrunner Models
- Hand tools from HCR, HCRK, PCR, HCX and PCX series with reaction torque sensors or action torque sensors
- Built-in tools from ECR1 and ECR2 series with reaction torque sensors or action torque sensors, as long as emergency stop is not required

Type	Dimensions (BxHxT) in mm	Weight in kg	Ident-No.
Nutrunner control SMXP twin	630x510x415	approx. 60	on request

Nutrunner Control SMXP Multi-Channel

E 1.8.7

1-64 Channel

Special Features - Technical Data

General
- Pentium processor
- Operating system: Windows XP Professional
- 8 GB hard drive and 3.5“/1.44 MB floppy disk drives
- 10/100 Mbit Ethernet interface, RJ45 network connector (e.g. for programming, nutrunner data transfer, etc.)
- Serial interface (e.g. for ID system, barcode reader, label printer, etc.)
- LPT1 printer interface
- USB printer interface
- USB interface for data backup

Assembly / Dimensions
- Dimensions :
  600mm x 2200mm x 500mm (BxHxT) max. 12 Channel
  800mm x 2200mm x 500mm (BxHxT) max. 16 Channel
- Protection: IP54

Display and Operator Controls
- TFT 15“ color monitor
- Full keyboard with mouse

Programming and Parameterization
- Integrated operator and parameter interface
- Via network

Nutrunning Processes
- Torque-controlled tightening
- Torque-controlled with angle monitor
- Angle-controlled with torque monitor
- Yield-controlled tightening
- Angle-controlled and torque-controlled loosening
- Shutdown based on digital signal with torque and angle control
- Friction measurement
- Retrospective nutrunning monitor
- Redundant motor current control
- Nutrunning time monitor

Periphery
- Operator control
- Socket box
- Indicators (e.g. lights, horn, sector division, etc.)
- Signal exchange with SPS:
  - I/O modules (parallel)
  - Field bus (e.g. Profibus, Interbus, DeviceNet, etc.)
- Barcode reader, data media (e.g. Moby E)

Number of Programs
- Max. 31 per tool (depends on the selection)

Enhanced Functions
- Part-based OK / fault information using counter function (available for multiple programs)
- Interface to part-based nominal data defaults from host computer
- Tightening data transfer to higher level systems
- Tightening location recognition (e.g. by ultrasound triangulation)
- Load-dependent maintenance management for carrying out preventive maintenance on handheld tools
- Centralized parameter management

Power Supply
- Control cabinet SMXP multi-channel: 400V / 50 Hz; 3-Phases, N, PE

Compatible Nutrunner Models
- Hand tools from HCR, HCRK, PCR, HCX and PCX series with reaction torque sensors or action torque sensors
- Built-in tools from ECR1 and ECR2 series with reaction torque sensors or action torque sensors

Type	Dimensions (BxHxT) in mm	Weight in kg	Ident-No.
Nutrunner control SMXP multi-channel	600x2200x500 800x2200x500	depending of the amount of channels	on request

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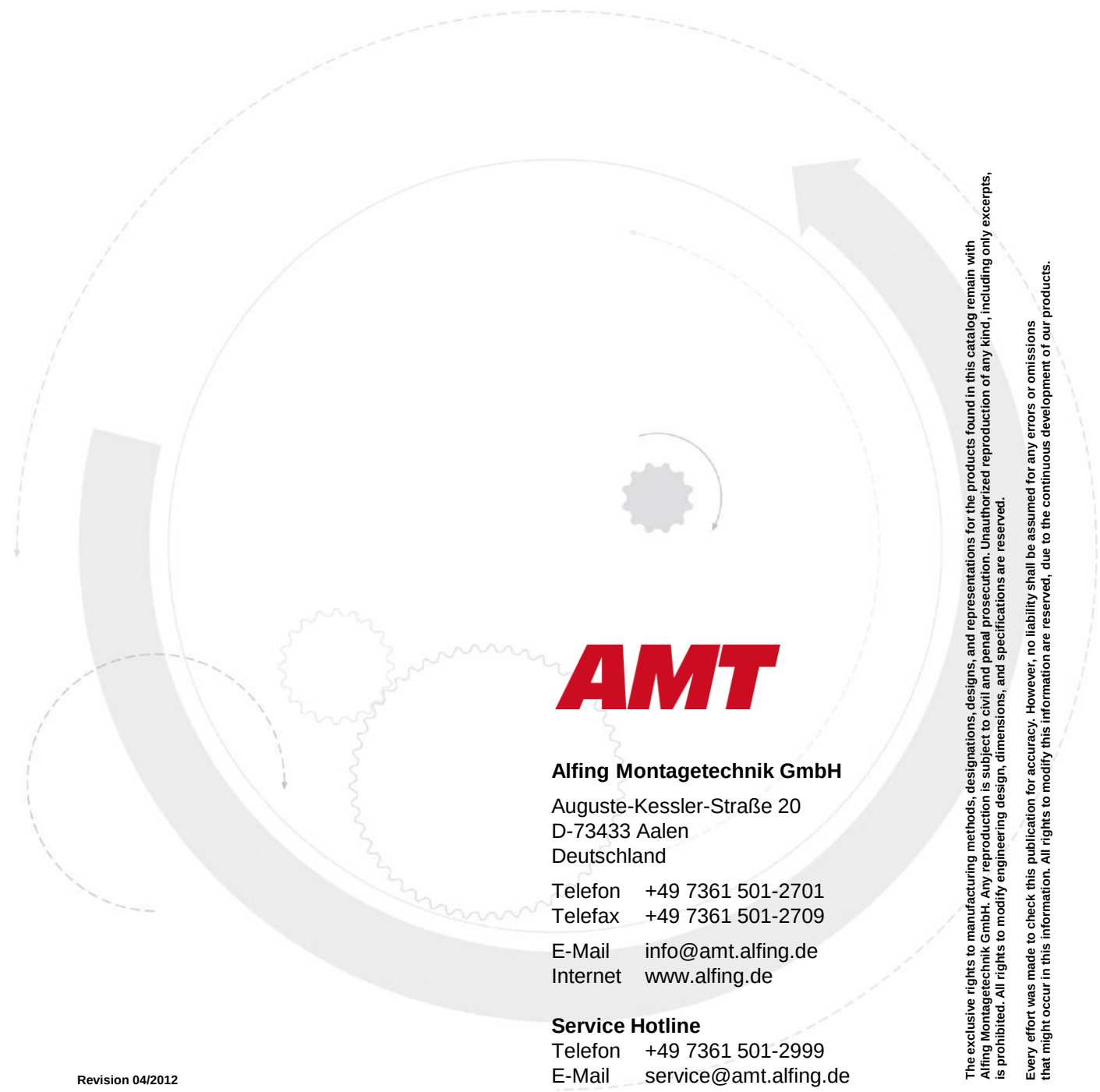

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