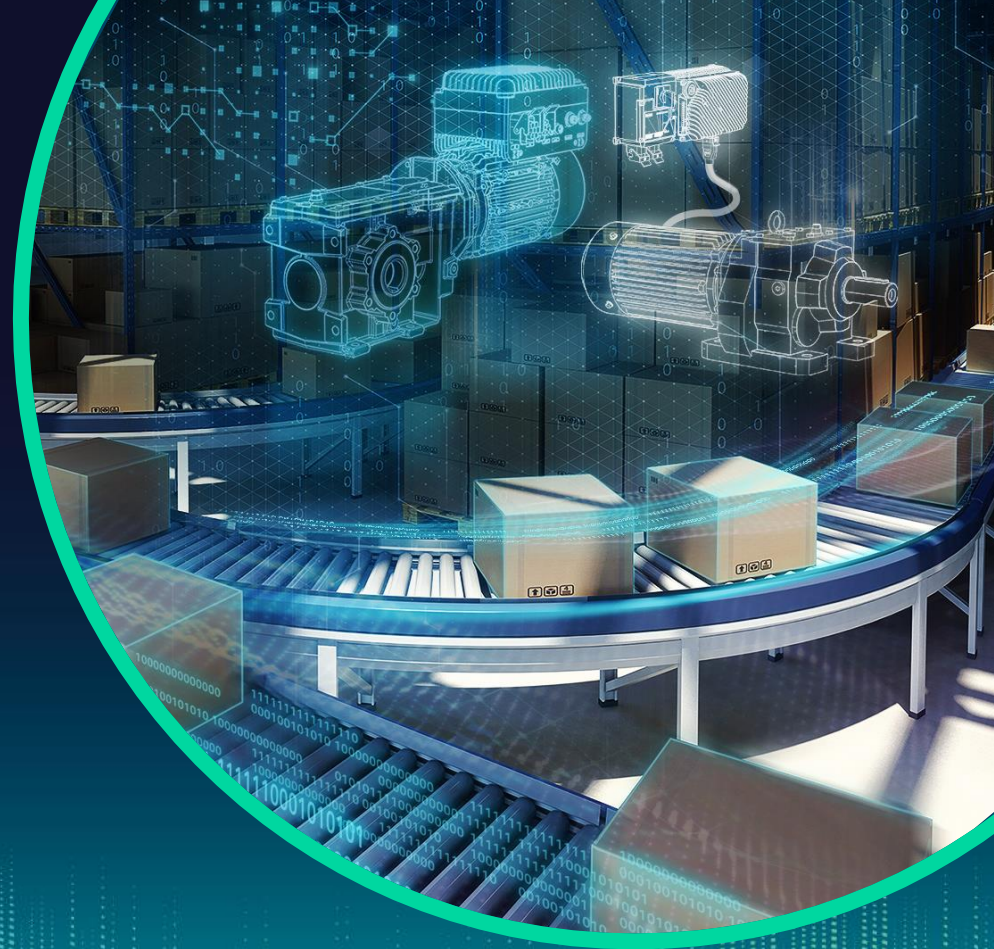


# SINAMICS G115D

Præsentation af ny frekvensomformer  
og nye funktionaliteter.

SIEMENS





# Dagens værdter

Jørn Lykke Sørensen, Technology Specialist  
Simon Sonne, Technology Specialist







# Intralogistics SINAMICS SIMOGEAR

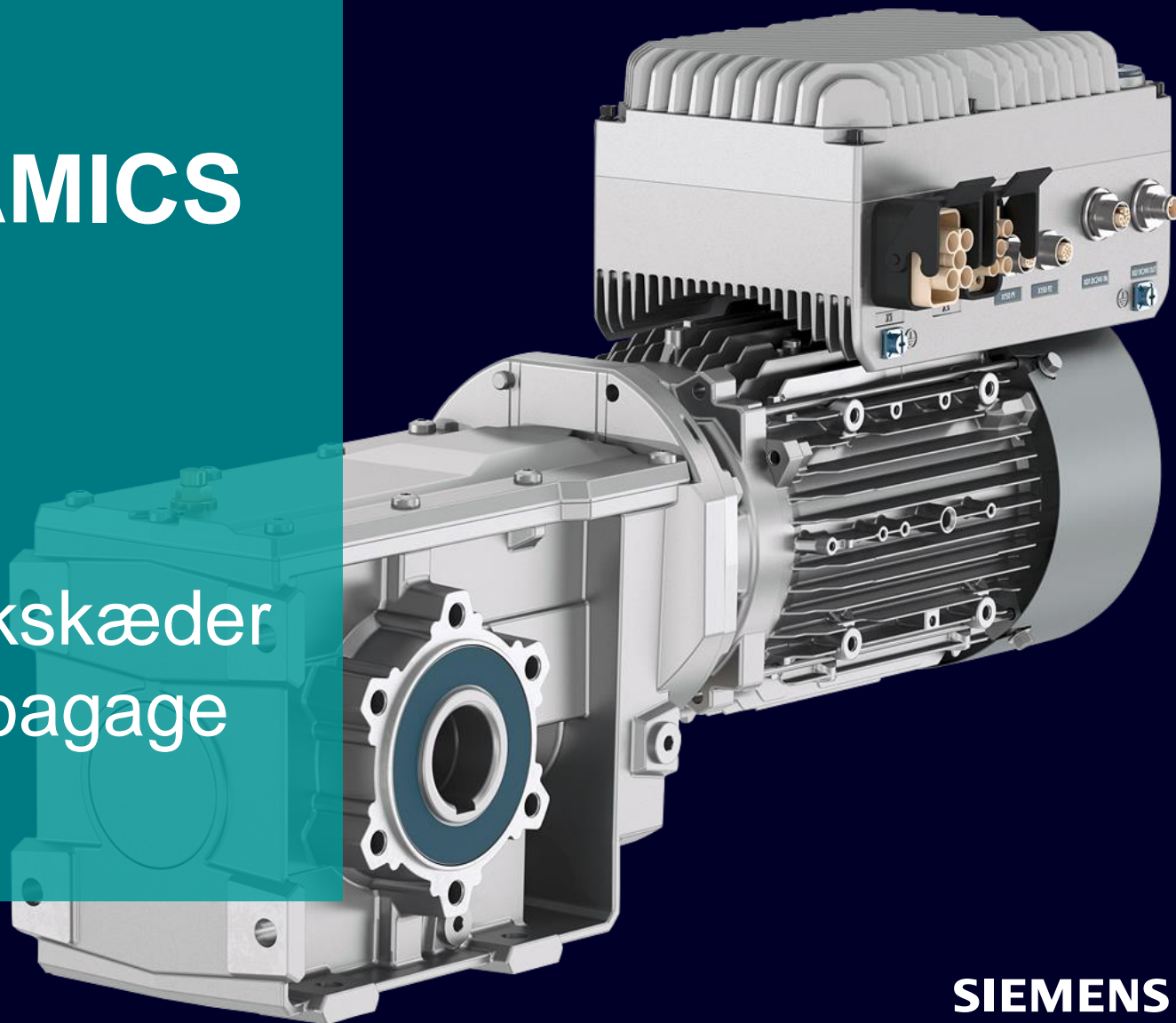
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# Intralogistics med SIMOGEAR og SINAMICS

Intern transport af emner:

- Fabrikker
- Distributionslagre for butikskæder
- Lufthavne til transport af bagage
- Post- og fragtcentraler



# Udfordringer med Intralogistics

- Parallel konstruktion af mekanik og el
- Kort tid til montage og idriftsættelse
- Meget varme i eltavlerne
- Langt fra eltavle til motor
- Høje energikrav

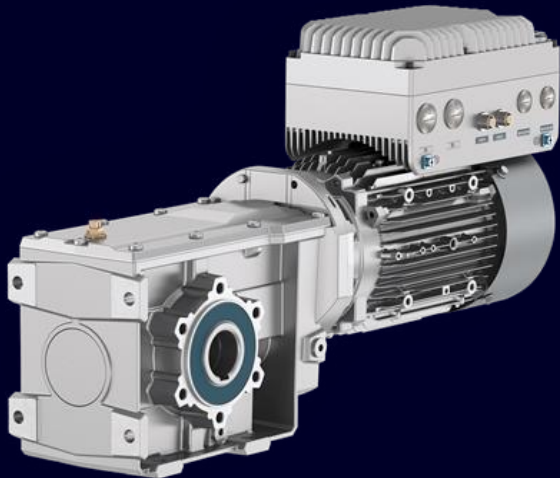
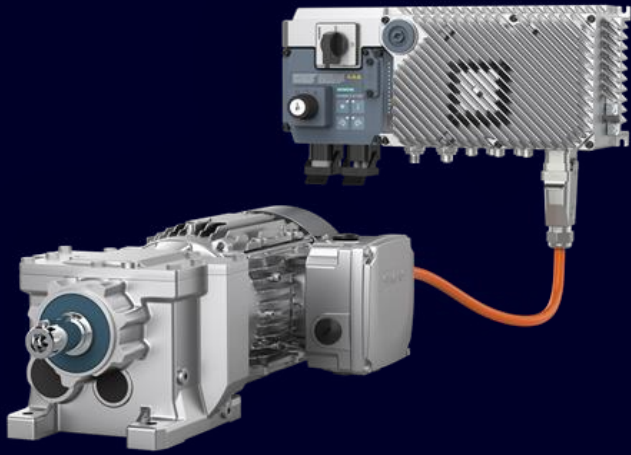


# G115D løser udfordringerne

- Decentral giver mindre tavle og nem kabling
- Du kan konstruere tavlen før mekanisk layout
- Beregn, konfigurer og dokumenter i TST
- Nem at montere og teste med WiFi
- Idriftsættelse i TIA
- Op til energiklasse IE4



# Hardware: G115D Wall- vs. Motor-mount



## Power ranges

- Motor mount 0,37 – 4,0 kW
- Wall mount 0,37 – 7,5 kW



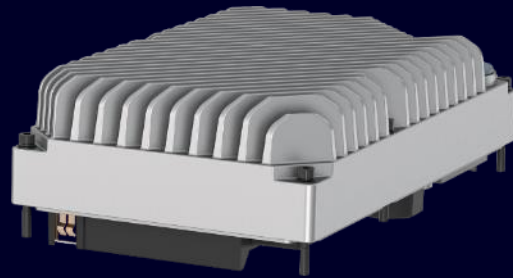
# A totally new modular approach

## Electronic module

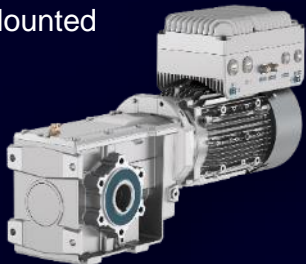
### Modular concept



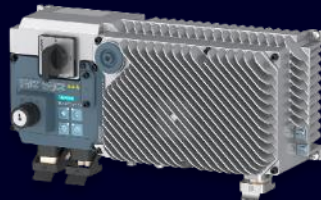
- **New** Same electronic module for both versions



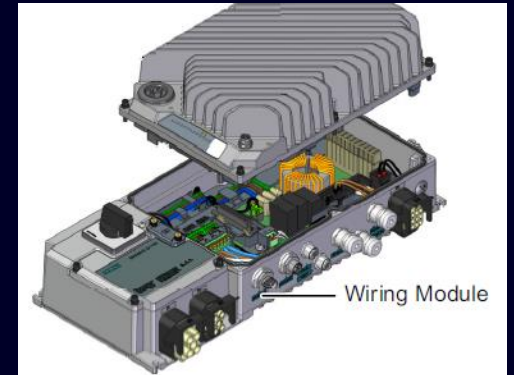
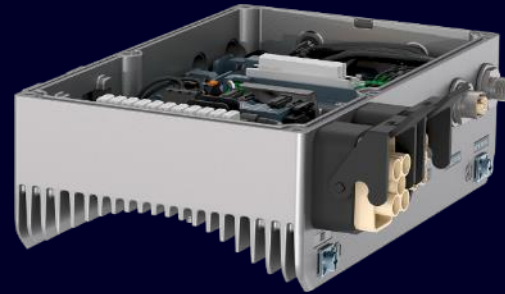
Motor Mounted



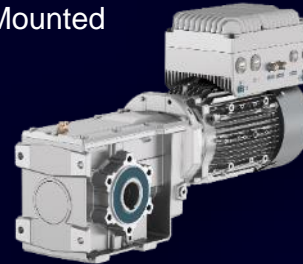
Wall Mounted



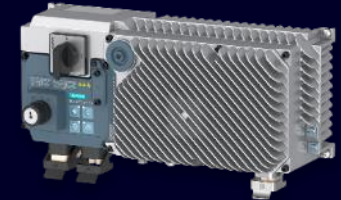
## Wiring module



Motor Mounted



Wall Mounted

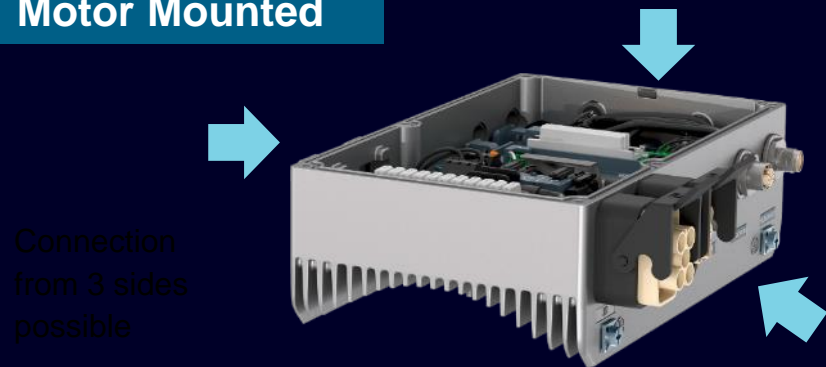


SINAMICS G115D = Electronic module + Wiring module

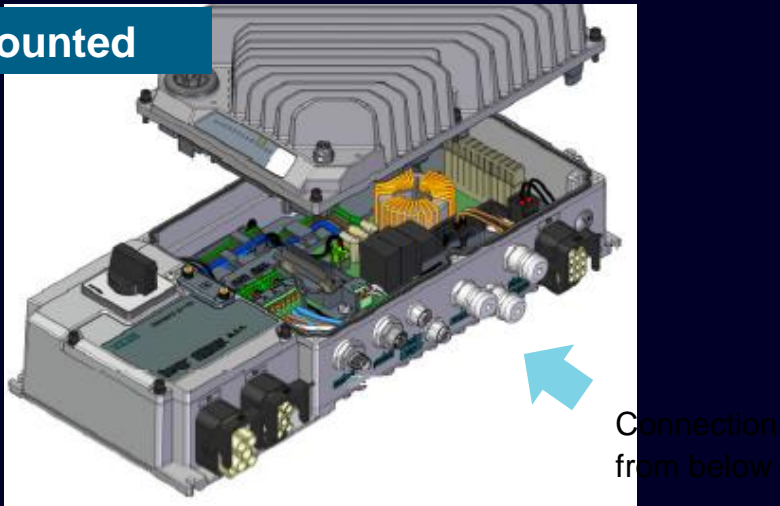


# Wiring module

## Motor Mounted



## Wall Mounted



## Easy wiring

- Large space for easy wiring
- Gland or connector variants
- Connection from 3 sides (MM) or just from below (WM)
- Simple commissioning using DIP switches
- Interface for optional SD memory card for simple converter exchange or downloading parameters



## Communication interface

- Integrated communication: PROFINET / Ethernet IP, AS-i or I/O control



## More added value

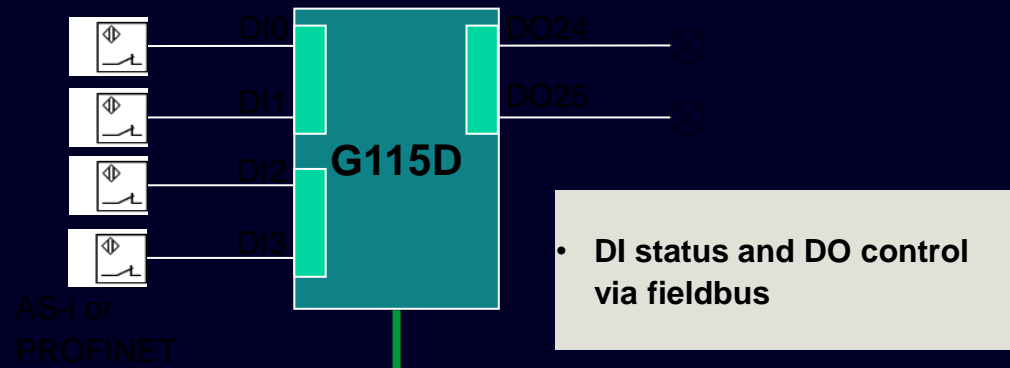
- Integrated electronic brake control, integrated braking resistor
- Optional integrated 24V power supply
- Integrated Daisy Chain (optional) or external T-distributor



# Digitale interface different use cases

1

## 4 DI and 2 DO



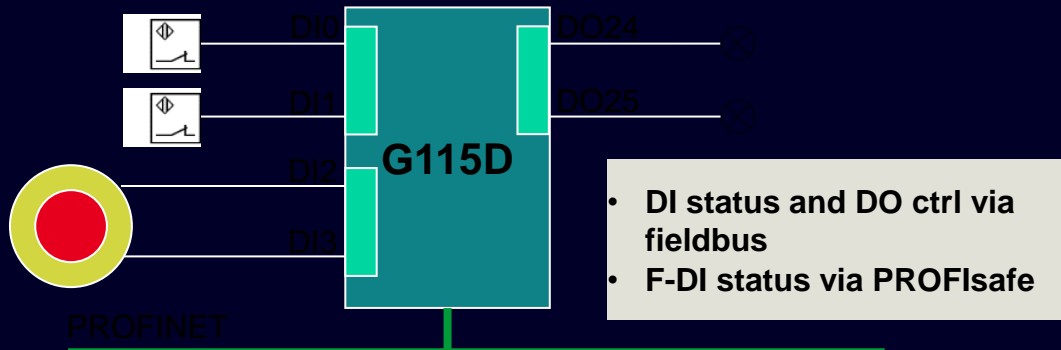
3

## 6 DI (DO as DI)



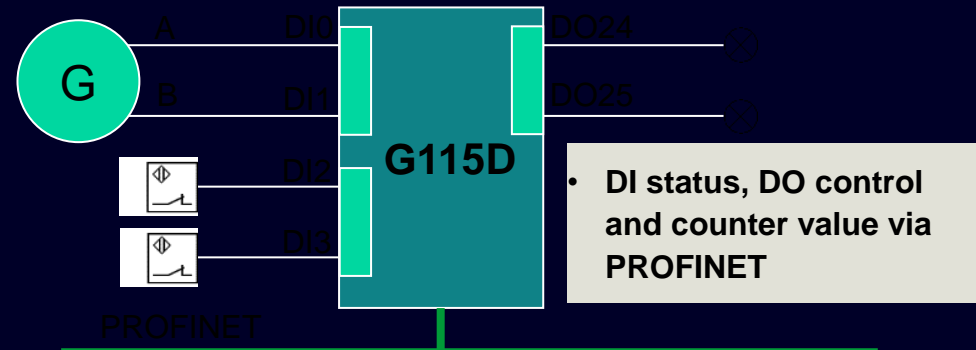
2

## 2 DI as F-DI



4

## 2 DI as HTL-Encoder interface





# Hardware: Cost effective and robust

## Solution

### Our SINAMICS G115D ...



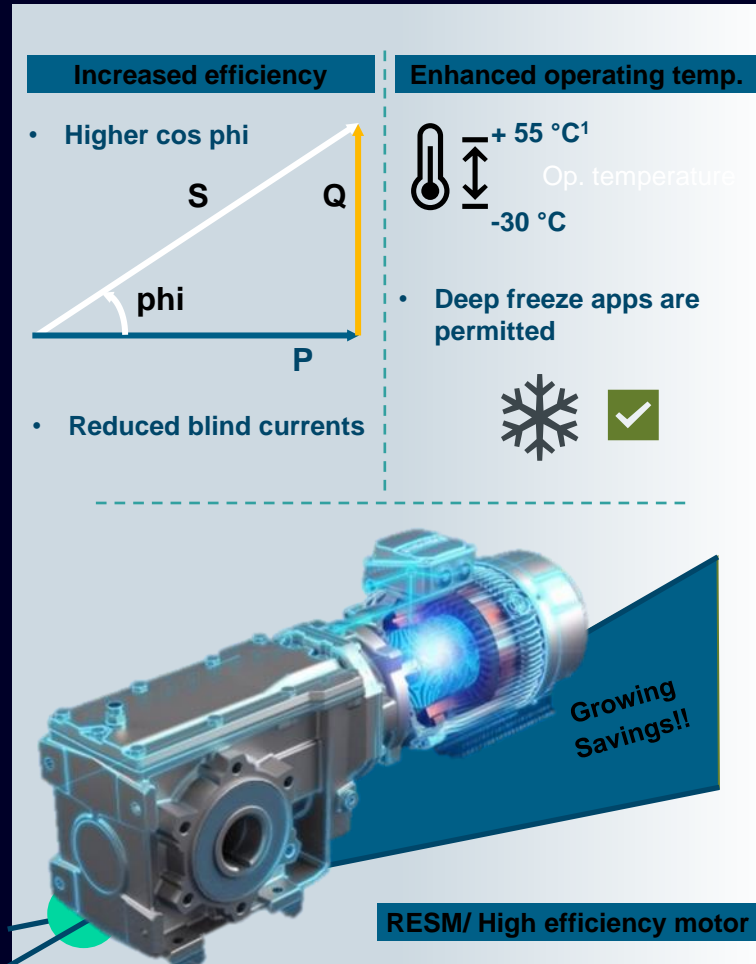
...is **grid friendly**: more efficient and with lower impact on the power quality



...supports **high efficiency motors**: IE2 / IE3 asynchronous + IE4 synchronous reluctance



...has the ability to **work in harsh cold environments**



RESM: Reluctance Synchronous Motor  
EMC: Electromagnetic Compatibility

## Highlights

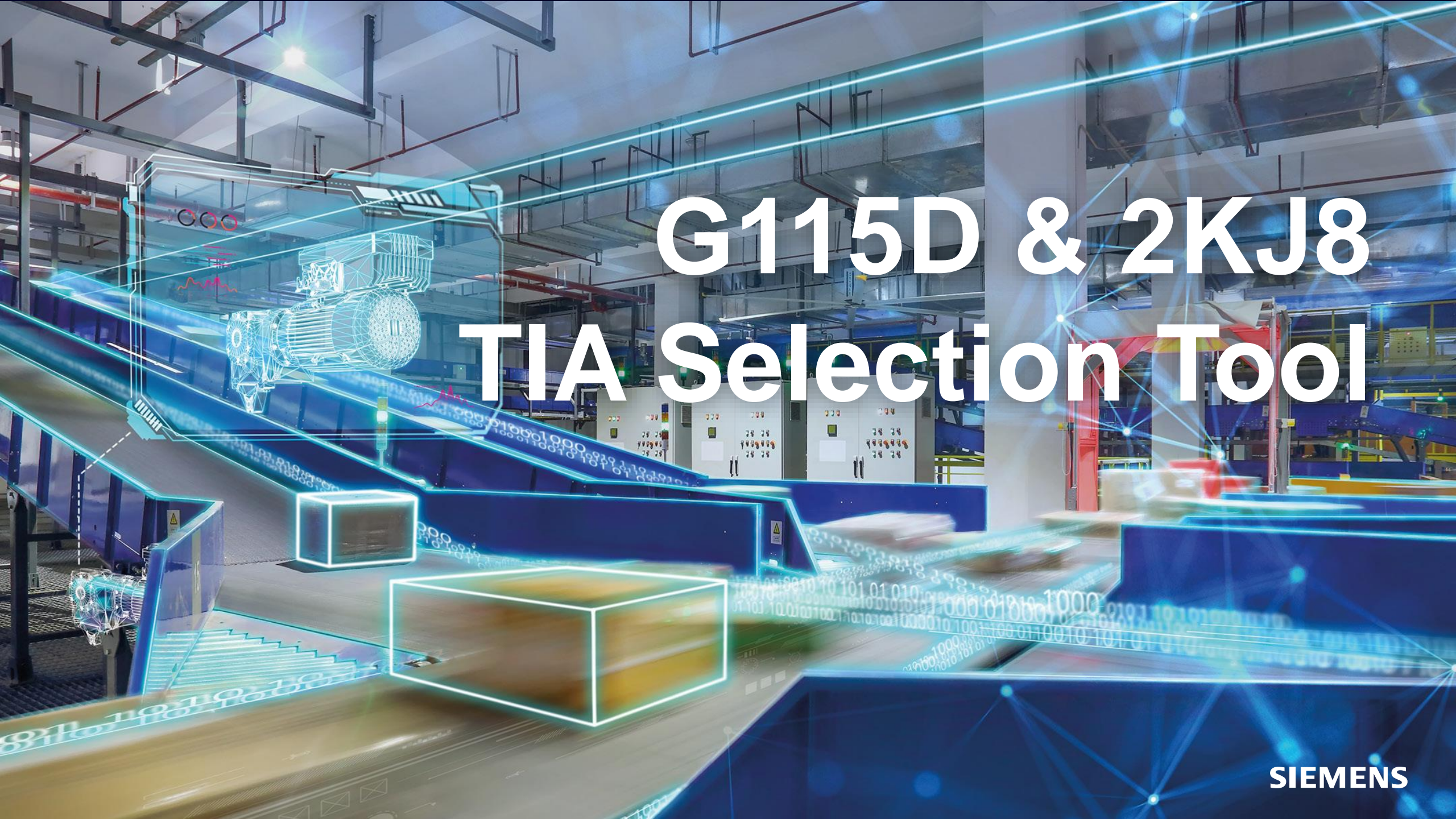


- **EMC category C2 compliant** (IEC 61800-3) and **increased efficiency** via higher  $\cos \phi$ / reduced blind currents
- **Flexible operation of high efficiency motors** to ensure more energy saving
- **3C2 coating, + extended operating temperatures**  $-30\text{ }^{\circ}\text{C}$  to  $40/55\text{ }^{\circ}\text{C}$  enable operation in harsh environments
- **Brake resistor integrated as standard**
- **Brake control and voltage supply of electromechanical brake implemented as standard**

<sup>1</sup> With derating

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# G115D & 2KJ8 TIA Selection Tool

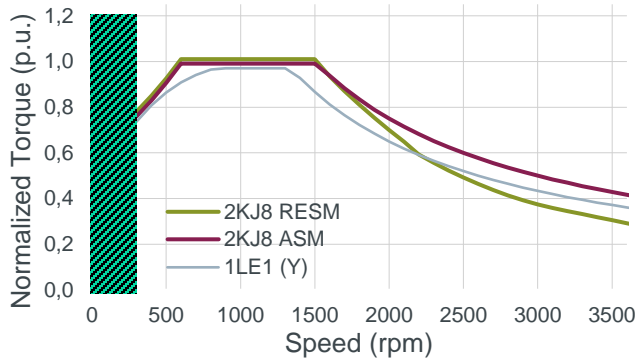
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# Speed ratio: Speed and torque MM

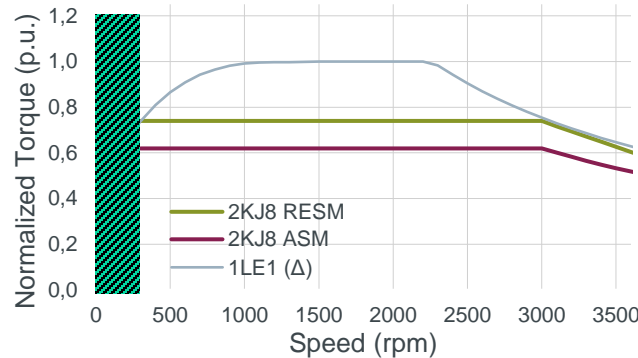


S1 @ G115D MM - speed range 1:5

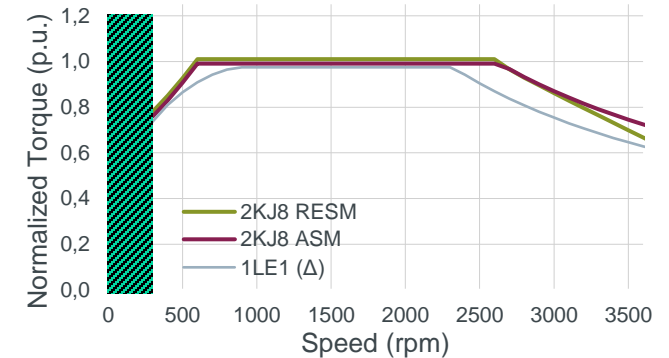


NEW

S1 @ G115D MM - speed range 1:10



S1 @ G115D MM - speed range 1:8.7



The geared motors are optimized to guarantee the rated operating point for all speed ranges (1:5, 1:8.7, 1:10) for the full voltage range 3AC 380-480V

- 1 Freq. converter is one step bigger than motor
- 2 Freq. converter is two steps bigger than motor

<sup>1</sup> Valid for Induction motors, RESM in preparation

WM: Wall Mounted  
MM: Motor Mounted

ASM: Asynchronous motors  
RESM: Reluctance synchronous motors

# Speed ratio: 1:5 standard 50 Hz solution



The geared motors are optimized to guarantee the rated operating point for all speed ranges (1:5, 1:8.7, 1:10) for the full voltage range 3AC 380-480V

- 1 Freq. converter is one step bigger than motor
- 2 Freq. converter is two steps bigger than motor

<sup>1</sup> Valid for Induction motors, RESM in preparation

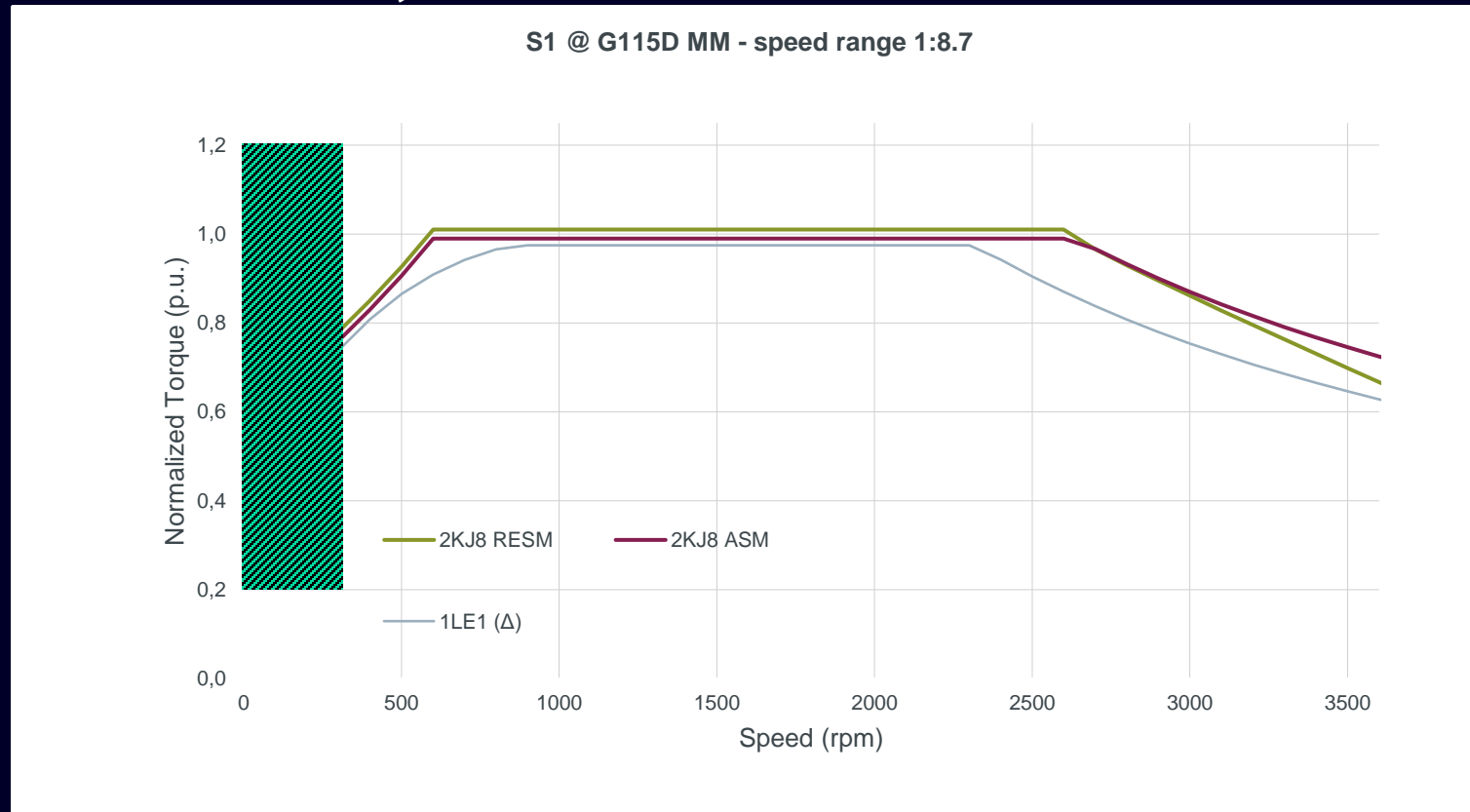
WM: Wall Mounted  
MM: Motor Mounted

ASM: Asynchronous motors  
RESM: Reluctance synchronous motors

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# Speed ratio: 1:8,7 87 Hz solution



The geared motors are optimized to guarantee the rated operating point for all speed ranges (1:5, 1:8.7, 1:10) for the full voltage range 3AC 380-480V

- 1 Freq. converter is one step bigger than motor
- 2 Freq. converter is two steps bigger than motor

<sup>1</sup> Valid for Induction motors, RESM in preparation

WM: Wall Mounted  
MM: Motor Mounted

ASM: Asynchronous motors  
RESM: Reluctance synchronous motors

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# Speed ratio: 1:10 100 Hz solution



The geared motors are optimized to guarantee the rated operating point for all speed ranges (1:5, 1:8.7, 1:10) for the full voltage range 3AC 380-480V

↑ Freq. converter is one step bigger than motor  
↑ Freq. converter is two steps bigger than motor

<sup>1</sup> Valid for Induction motors, RESM in preparation

WM: Wall Mounted  
MM: Motor Mounted

ASM: Asynchronous motors  
RESM: Reluctance synchronous motors

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# G115D SIMOGEAR solution

## SIMOGEAR overview

### Gears

Portfolio available in

■ SIMOGEAR [2KJ3 & 2KJ4] ■ G115D [2KJ8]

Gearbox types	Helical		Parallel shaft		Bevel		Helical worm		Monorail		Worm		Tandem	
														
Gearbox sizes [FS]	19	29	39	49	59	69	79	89	109	129	149	169	189	

### Motor types

Motor types Efficiency	Asynchronous for all gearbox FS 19-89				Reluctance for all gearbox FS 19-89				Asynchronous			VSD10
	IE2 (AH71)		IE3/NPE (> AH80)		IE4				IE1	IE2	IE3	
Motor types [FS]	< 0.25 kW	0.37 – 7.5 kW						9.2 – 55 kW				
	63	71	80	90	100	112	132	160	180	200	225	250
Motor poles						4	2	6	8			



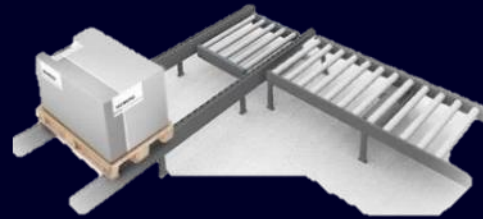
# G115D og 2KJ8 TIA-portalen



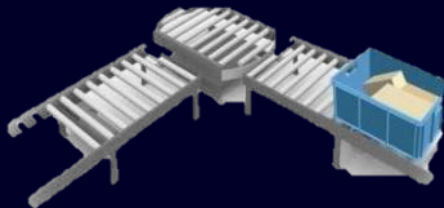
# Integrated functions for conveyor technology



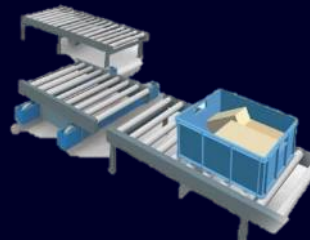
Conveyor with fast- / slow speed and Quick-Stop (1 or 2 directions)



Corner turntable lift with fast- / slow speed, Quick-Stop and limit switch



Turntable with fast- / slow speed, Quick-Stop and limit switch (2 or 3 positions)



Travelling trolley with fast- / slow speed, Quick-Stop and limit switch

## Easy to use functions +

- Standard integrated conveyor functions (in PN and AS-i Variants)
- **New** Wizard for Startdrive and Smart Access Module

## Benefits +

- Reproducible stop reaction
- Reduced load of the PLC



# Conveyor functionality



## Conveyor control<sup>1</sup>



Conveyor with fast- / slow speed and  
Quick-Stop (1 or 2 directions)

## Feature/ Function

The conveyor control function allows to **move materials from one location to another** via any of the different types of conveyors (e.g. roller conveyors, chain conveyors, or belt conveyors) depending on particular applications at a certain fixed speed in 1 or 2 directions.

### There are 4 different possibilities:

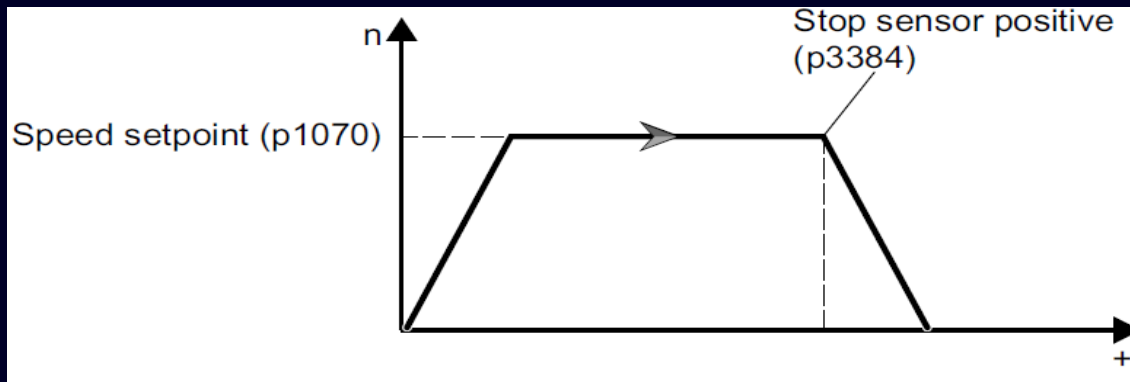
- One direction, one speed
- One direction, two speeds
- Two directions, one speed
- Two direction, two

Related parameters: p1070, p1113, p3384, p3385, p3387, p3388, p3390, p3394, p3398

# Conveyor control function 1



1 direction and 1 speed (p3393 = 1)



The converter enables the load on a conveyor belt to move in one direction with a fixed speed

## Feature/ Function

### With the ON command

setpoint (p1070). The direction of the movement depends on the setpoint inversion:

- p1113 = 0: positive direction
- p1113 = 1: negative direction

### The motor stops with OFF1 ramp

positive direction (p3384) is triggered (level/edge triggered depending on p3394).

Setting the sensor bypass signal (p3390) to 1 overrides the stop sensor signal p3384.

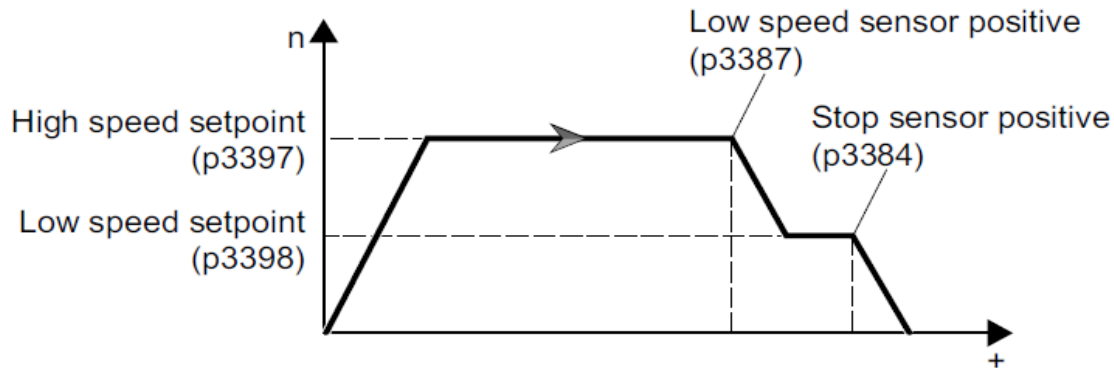
Related parameters: p1070, p1113, p3384, p3390, p3394

**Precondition:** A sensor is required to signal the limit. The signal of the sensor needs to be interconnected with the digital input of choice

# Conveyor control function 2



1 direction and 2 speeds (p3393 = 2)



The converter enables the load on a conveyor belt to move in one direction with variable speeds

## Feature/ Function

### With the ON command

speed setpoint (p3397). The direction of the movement depends on the setpoint inversion:

- p1113 = 0: positive direction
- p1113 = 1: negative direction

### The motor decelerates with OFF1 ramp

setpoint (p3398) when the low speed sensor positive direction (p3387) is triggered (level/edge triggered depending on p3395)

### The motor stops with OFF1

positive direction (p3384) is triggered (level/edge triggered depending on p3394).

Setting the sensor bypass signal (p3390) to 1 overrides the sensor signals p3384 and p3387

Related parameters: p1113, p3384 , p3387, p3390, p3394 ... p3398

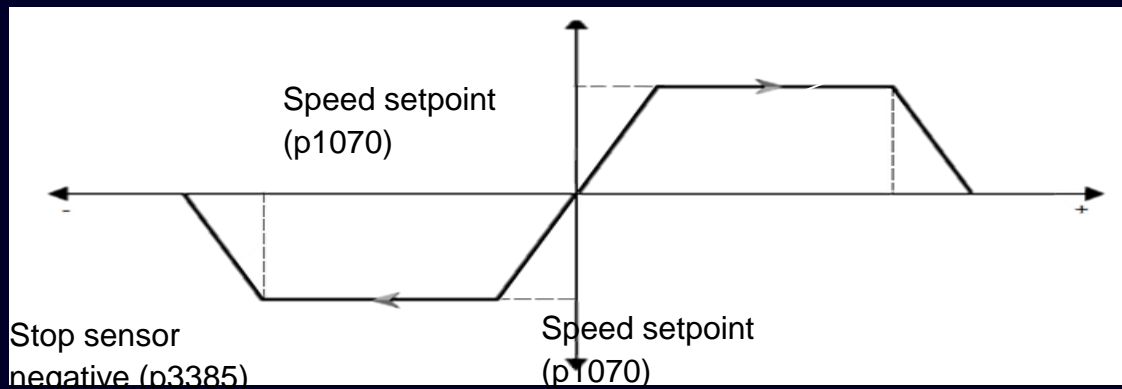
**Precondition:** 2 sensors are required to signal the limit positions for the motor to stop or decelerate. The signal of the sensors needs to be interconnected with the digital input of choice



# Conveyor control function 3



2 directions and 1 speed (p3393 = 3)



The converter enables the load on a conveyor belt to move in either (+) or (-) direction with a fixed speed

## Feature/ Function

### With the ON command

(p1070). The load can move in either positive or negative direction depending on the setting of:

- p1113 = 0: positive direction ; p1113 = 1: negative direction

### With the movement in positive direction

- **The motor stops with OFF1 ramp** direction (p3384) is triggered (level/edge triggered depending on p3394).
- No motor reaction is triggered by the stop sensor negative direction signal (p3385).

### With the movement in negative direction

- **The motor stops with OFF1 ramp** direction (p3385) is triggered (level/edge triggered depending on p3394).
- No motor reaction is triggered by the stop sensor positive direction signal (p3384).
- Setting the sensor bypass signal (p3390) to 1 overrides the sensor signals p3384 and p3385.

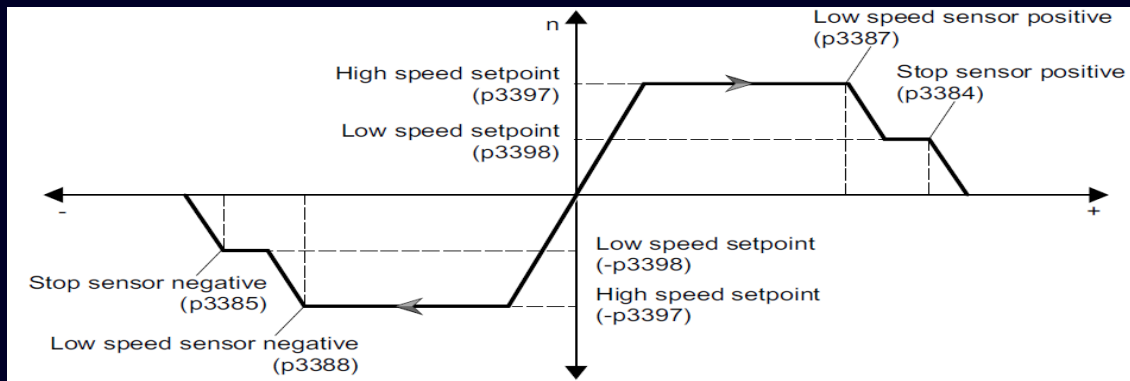
Related parameters: p1113, p1070, p3384, p3385, p3390, p3394

**Precondition:** 2 sensors are required to signal the limit positions for the motor to stop. The signal of the sensors needs to be interconnected with the digital input of choice

# Conveyor control function 4 (1/2)



2 directions and 2 speeds (p3393 = 4)



The converter enables the load on a conveyor belt to move in either (+) or (-) direction with variable speeds

## Feature/ Function

### With the ON command

speed setpoint (p3397). The load can move in either (+) or (-) direction, depending on:

- p1113 = 0: positive direction; p1113 = 1: negative direction

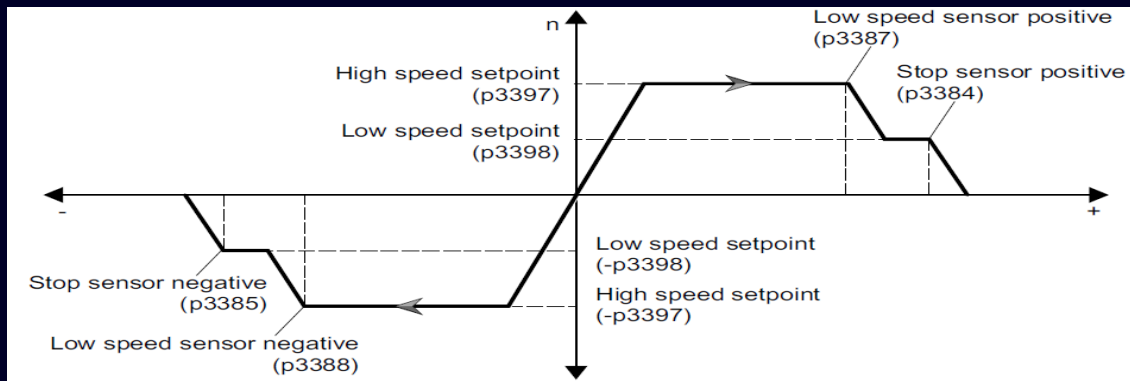
### With the movement in positive direction:

- **The motor decelerates with OFF1 ramp**  
setpoint (p3398) when the low speed sensor positive direction (p3387) is triggered (level/edge triggered depending on p3395).
- **The motor stops with OFF1 ramp**  
positive direction (p3384) is triggered (level/edge triggered depending on p3394).
- **No motor reaction is triggered**  
direction (p3385) and low speed sensor negative direction (p3388) signals.

# Conveyor control function 4 (2/2)



2 directions and 2 speeds (p3393 = 4)



The converter enables the load on a conveyor belt to move in either (+) or (-) direction with variable speeds

## Feature/ Function

### With the movement in negative direction:

- **The motor decelerates with OFF1 ramp** setpoint (p3398) when the low speed sensor negative direction (p3388) is triggered (level/edge triggered depending on p3395).
- **The motor stops with OFF1 ramp** negative direction (p3385) is triggered (level/edge triggered depending on p3394).
- **No motor reaction is triggered** direction (p3384) and low speed sensor positive direction (p3387) signals.

Setting the sensor bypass signal (p3390) to 1 overrides the sensor signals p3384, p3385, p3387, and p3388.

Related parameters: p1113, p3384, p3385, p3387, p3388, p3390, p3394, p3398

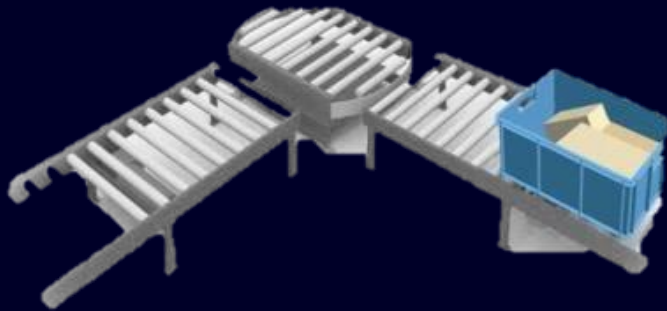
**Precondition:** 4 sensors are required to signal the limit positions for the motor to stop or decelerate. The signal of the sensors needs to be interconnected with the digital input of choice



# Turntable functionality



Turntable<sup>1</sup>



Turntable with fast- / slow speed, Quick-Stop and limit switch (2 or 3 positions)

## Feature/ Function

In a conveyor system a turntable **allows to redirect the material at the crossing of two conveyor lines**

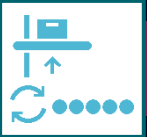
The turntable rotates from one end position to the other in the direction depending on the setting of the end position shutdown (p3392) and the polarity of the speed setpoint..

### There are 4 different possibilities:

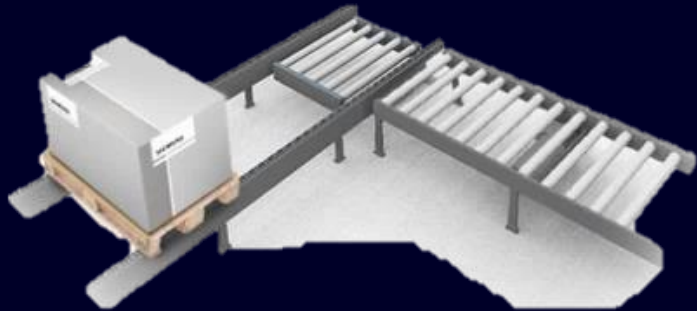
- Two positions, one speed
- Two positions, two speeds
- Three positions, one speed
- Three positions, two speed

Related parameters: p1070, p1113, p3384, p3385, p3390, p3392 p3394, p3397

# Corner turntable lift functionality



## Corner turntable lifts<sup>1</sup>



### Feature/ Function

The corner turntable lift function allows to transfer load coming from a conveyor system from one level to another by moving up or down.

#### There are 2 different possibilities:

- Two positions, one speed
- Two positions, two speeds

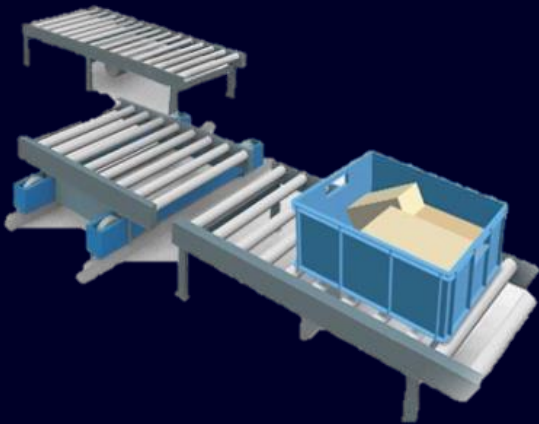
**Corner turntable lift with fast- / slow speed,  
Quick-Stop and limit switch**

**Related parameters: p1113, p1070, p3384...p3389, p3390, p3394, p3398**

# Traveling trolley functionality



Travelling trolley<sup>1</sup>



## Feature/ Function

The travelling trolley functionality allows to move a load along a fixed path with specific positions for loading and discharge.

**There are 2 different possibilities:**

- One speed
- Two speeds

**Travelling trolley with fast- / slow speed,  
Quick-Stop and limit switch**

Related parameters: p1070, p1113, p3384, p3385, p3386, p3387, p3389,  
p3397



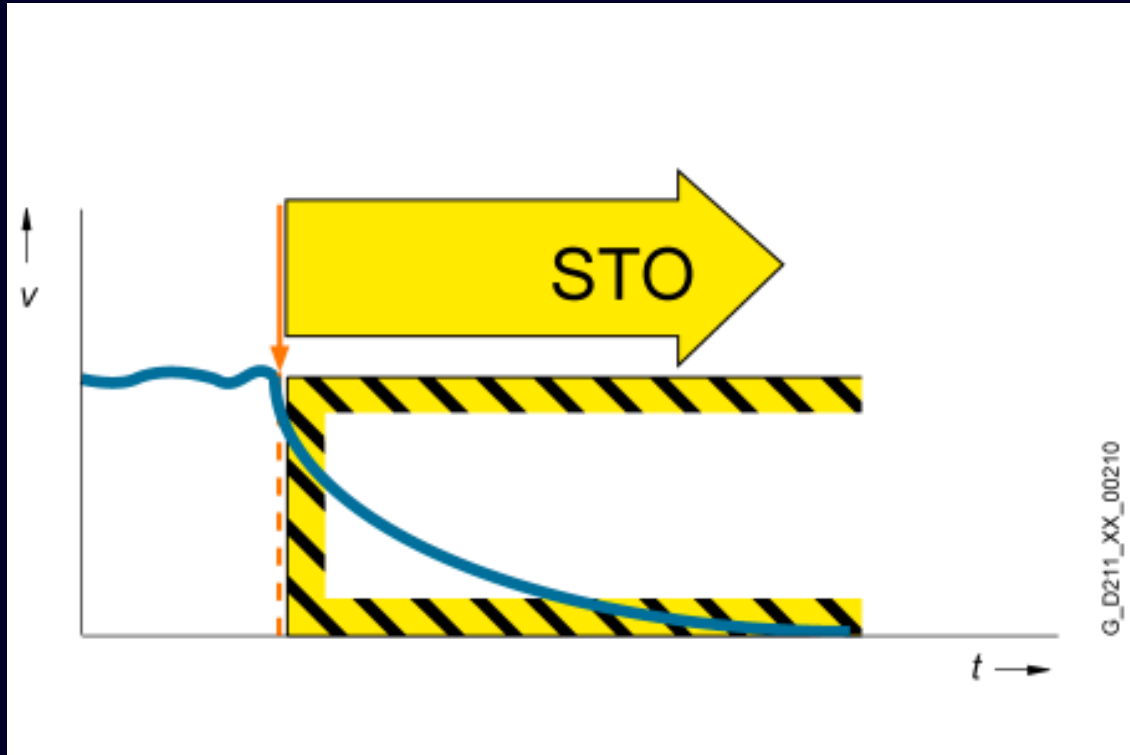
# Safety

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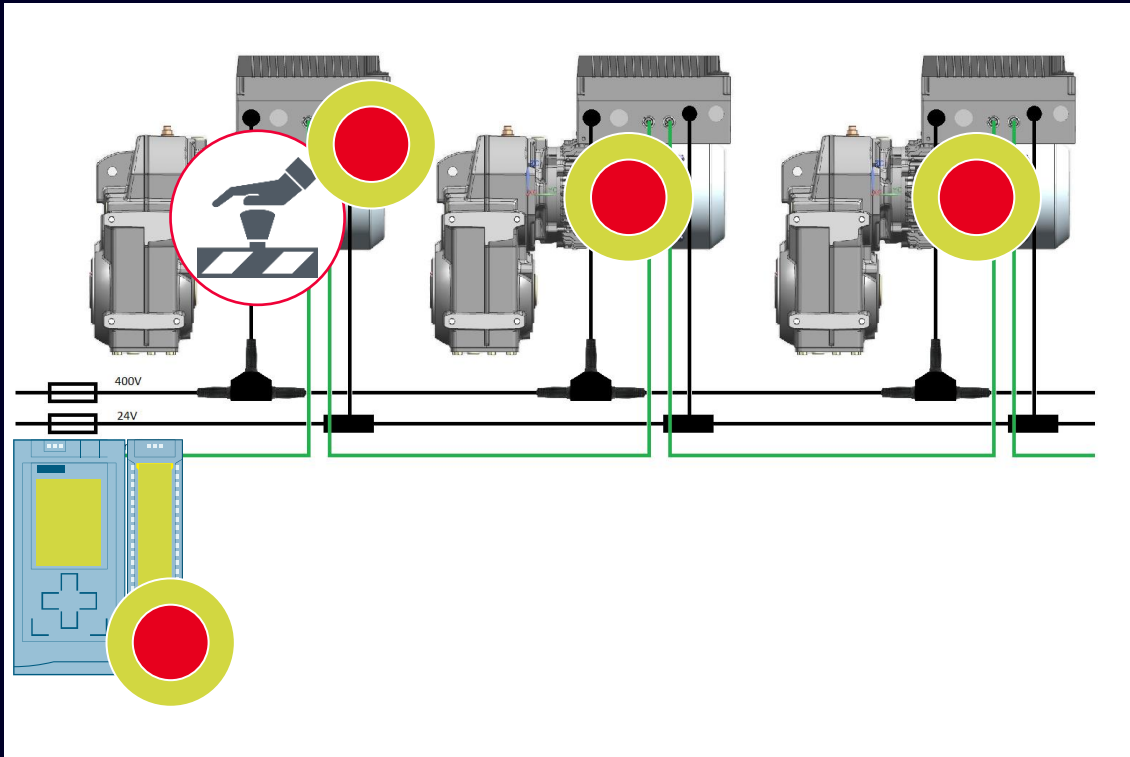
# Safety i G115D



## Basic Safety

- G115D understøtter STO på terminaler og PROFI-safe
- Monter nødstop direkte på DI 2+3, eller benyt STO via PROFI-safe

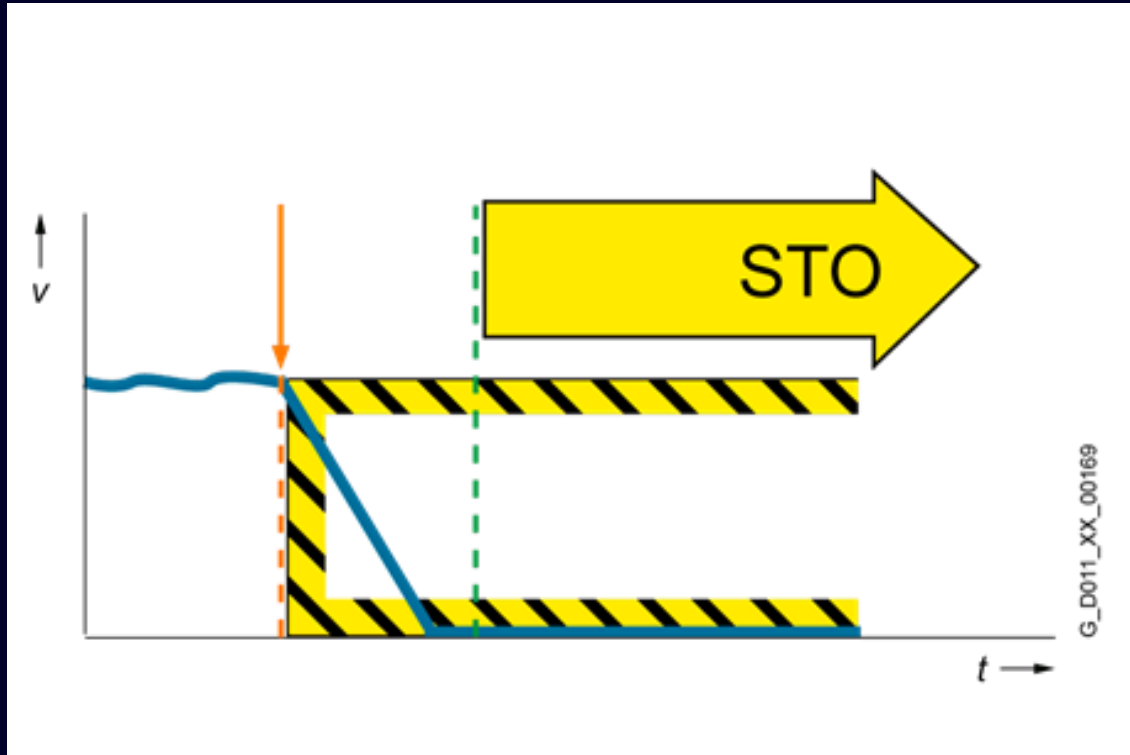
# Safety i G115D



## Basic Safety

- Kombiner terminaler og PROFI-safe, så dit nødstopstryk ikke bare aktiverer STO lokalt, men også kan bruges i dit Safety-program

# Safety i G115D



## Basic Safety

- Byg en SS1-t i dit Safety-program og aktiver STO via PROFIsafe
- På den måde kan du kontrolleret bremse din motor ned, inden du fjerner momentet



# Storebror G120D supplier G115D

- Extended Safety SLS, SSM, SDI .
- Closed Loop
- Regenerativ



# | Kontakt

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Simon Sonne

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