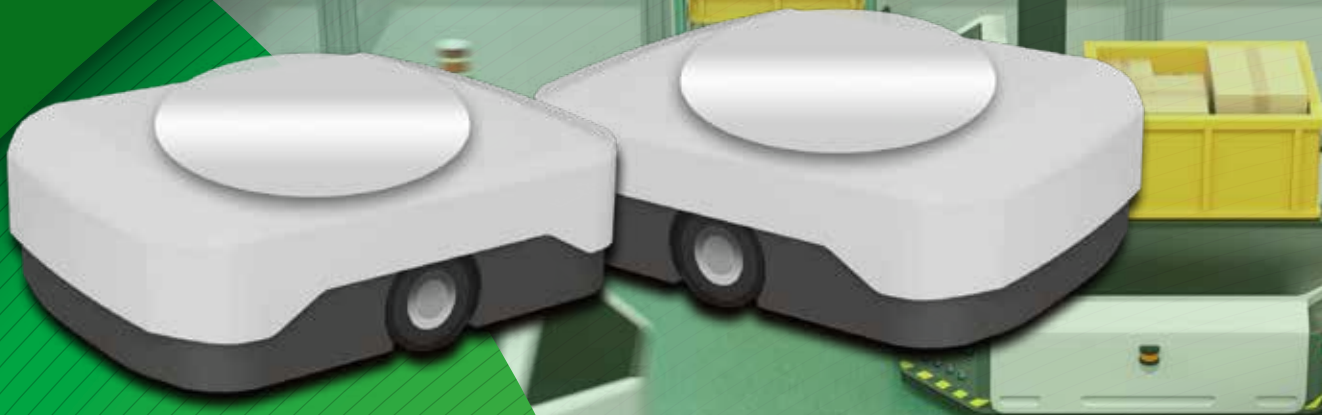


**CONTROL TECHNIQUES  
DYNAMICS**

SERVO MOTOR SOLUTIONS FOR

# AUTONOMOUS GUIDED VEHICLES



## COMPLETE SOLUTIONS

Our Motion Control group excels at designing AGV motors and drive systems that offer innovative technology along with long-lasting quality. We have designed customised AGV solutions for some of the biggest names in distribution. You can depend on our products to provide the energy efficiency and longevity you require.

060 / 089 / 142 Frames  
FOR PAYLOADS UPTO 2000KG

**Nidec**  
—All for dreams

## GROWING DEMANDS

Across all industries, e-commerce and the medical sector, a huge rise in demand for automation, logistics and material handling is being seen.

With requirements such as space, improved efficiency & performance, rapid response and a reduction in waste, companies are turning to automation and investing in mobile robots to achieve these goals.



## SPACE IS AT A PREMIUM

Manufacturers face multiple challenges, and space limitations can have an affect on most of them. Space saving designs within the mobile robot itself will translate into reduced weight for the overall unit, which in-turn then reduces the time required between charging.

**Our AGV kit solutions are perfect to address these concerns. The highly efficient and reliable in-wheel gearbox design gives a very compact combination with minimal weight.**

**Each kit will come with 2 motors, fitted with integrated gearboxes and mounted with industry standard AGV wheels, along with the control drive and cables to give you everything needed to make a mobile robot. This ensures less time for you in sourcing multiple components and giving a more rapid development of individual solutions.**



## FULL CONTROL

Compared to traditional 1 motor and 1 drive offerings, our AGV kit solutions offer simpler integration, maintenance, smooth and precise motion control and lower costs by using a single drive to operate 2 motors at the same time.

Ideal for applications such as:-

- AGV's & AMR's
- Small Electric Vehicles
- Terrestrial and Underwater Robotic Vehicles
- Hazardous Material Handling Robots
- Balancing Robots

## QUICK REFERENCE TABLE

|   | AGV 060 |    | AGV 089 |    | AGV 142 |    |
|---|---------|----|---------|----|---------|----|
| <b>Speed (m/s)</b>                                | 2.8     |    | 2.8     |    | 2.0     |    |
| <b>Acceleration (m/s<sup>2</sup>)<sup>1</sup></b> | 2       |    | 1.5     |    | 0.5     |    |
| <b>Max Payload (kg)<sup>2</sup></b>               | 500     |    | 1000    |    | 2000    |    |
| <b>Max Gearbox Torque (Nm)<sup>3</sup></b>        | 70      |    | 70      |    | 180     |    |
| <b>Voltages</b>                                   | 24      | 48 | 24      | 48 | 24      | 48 |
| <b>Recommended Drive</b>                          | SBL2360 |    | FBL2360 |    | GBL2660 |    |
| <b>Wheel Size (mm)</b>                            | 156.4   |    | 156.4   |    | 202.8   |    |

<sup>1</sup> Calculated using two drive wheels per AGV solution.

<sup>2</sup> Based on 0.25m/s<sup>2</sup> acceleration.

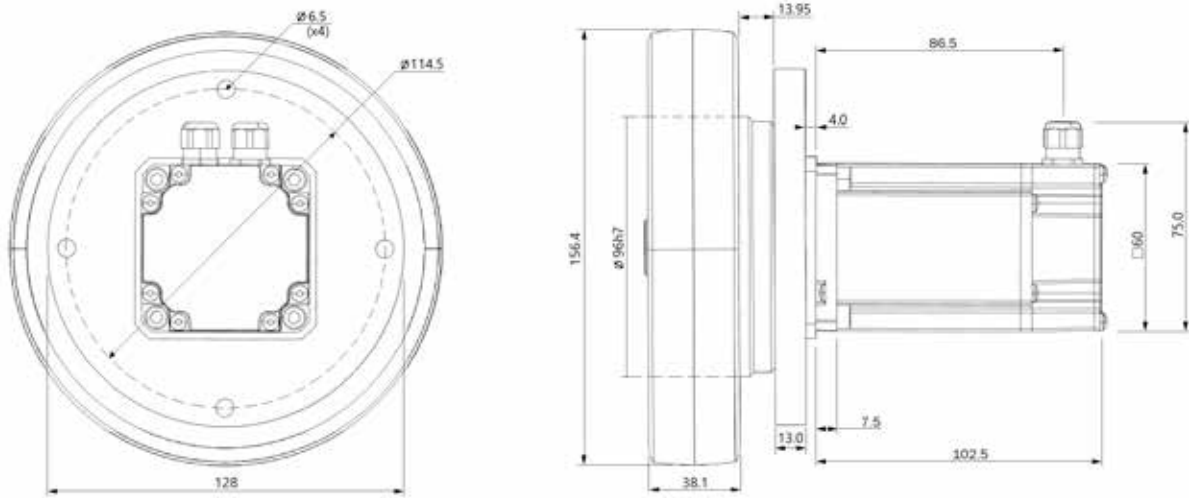
<sup>3</sup> Max torque for 20,000 hours of operation.

# 500KG PAYLOAD SOLUTION

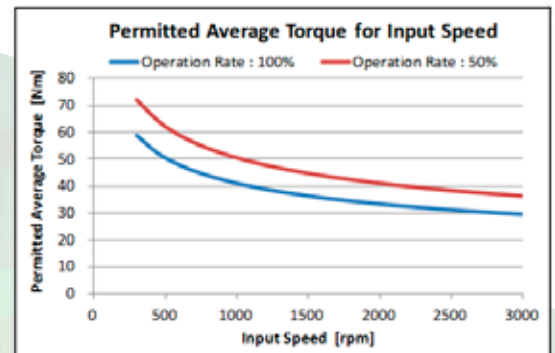
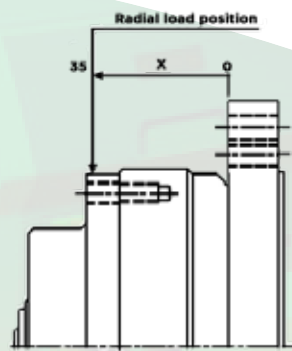
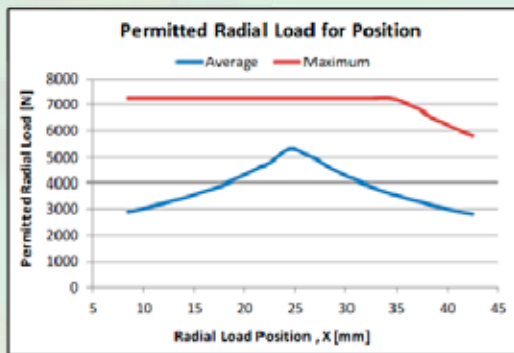
## AGV 060



### MOTOR INC. WHEEL DIMENSIONS



### RADIAL LOAD GRAPHS



These charts refer to both the AGV 060 and the AGV 089 solution.

### ORDERING INFORMATION

| Solution Order Code | Voltage | Speeds  | Brake | Drive Type | IP Rating |
|---------------------|---------|---------|-------|------------|-----------|
| <b>AGV060LB300</b>  | 48V     | 2.4 m/s | NO    | CANbus     | 54        |
| <b>AGV060AB150</b>  | 24V     | 1.2 m/s | NO    | CANbus     | 54        |

For braked solutions, please contact [ctdsales@mail.nidec.com](mailto:ctdsales@mail.nidec.com) for more information.

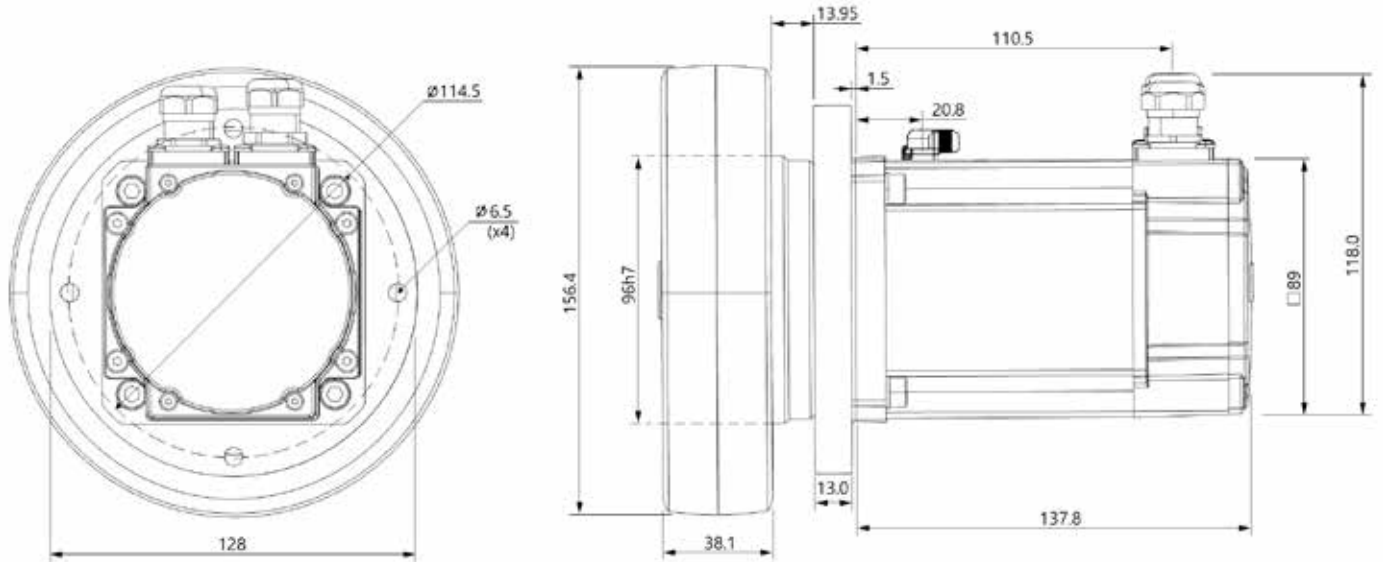


# 1000KG PAYLOAD SOLUTION

## AGV 089



### MOTOR INC. WHEEL DIMENSIONS



### RADIAL LOAD GRAPHS

Please refer to charts on page 4.

### ORDERING INFORMATION

| Solution Order Code | Voltage | Speeds  | Brake | Drive Type <sup>1</sup> | IP Rating |
|---------------------|---------|---------|-------|-------------------------|-----------|
| <b>AGV089LA300</b>  | 48V     | 2.4 m/s | NO    | CANbus                  | 54        |
| <b>AGV089LA30X</b>  | 48V     | 2.4 m/s | YES   | CANbus                  | 54        |
| <b>AGV089LA150</b>  | 48V     | 1.2 m/s | NO    | CANbus                  | 54        |
| <b>AGV089LA15X</b>  | 48V     | 1.2 m/s | YES   | CANbus                  | 54        |
| <b>AGV089AA150</b>  | 24V     | 1.2 m/s | NO    | CANbus                  | 54        |
| <b>AGV089AA15X</b>  | 24V     | 1.2 m/s | YES   | CANbus                  | 54        |

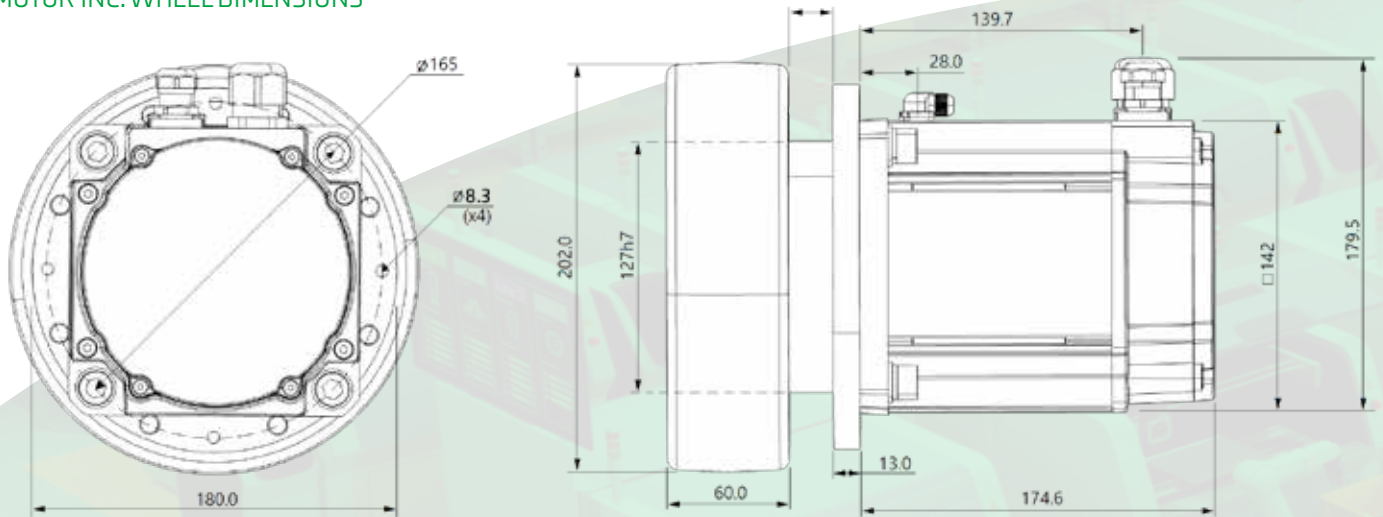
<sup>1</sup> If you require an Ethernet drive type then add an 'E' to the end of the order code. e.g. AGV089LA300E

# 2000KG PAYLOAD SOLUTION

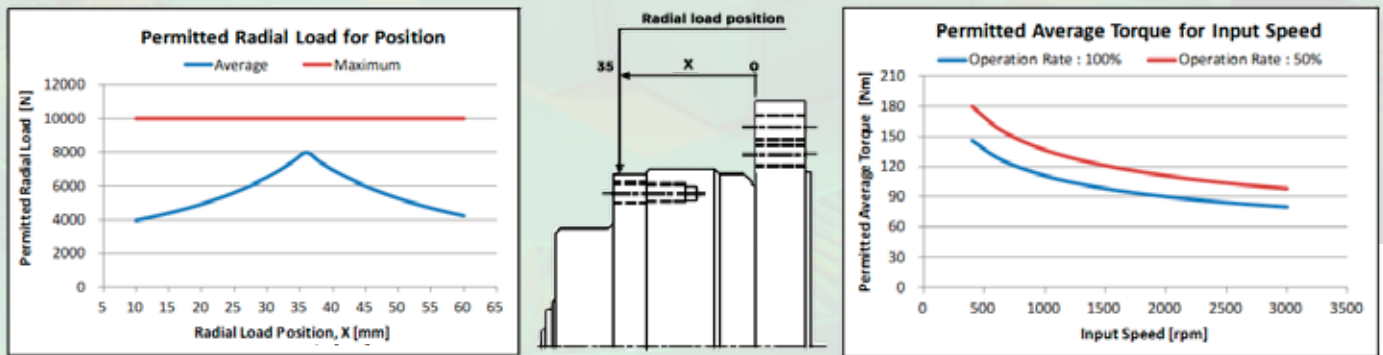
## AGV 142



### MOTOR INC. WHEEL DIMENSIONS



### RADIAL LOAD GRAPHS



### ORDERING INFORMATION

| Solution Order Code | Voltage | Speeds  | Brake | Drive Type <sup>1</sup> | IP Rating |
|---------------------|---------|---------|-------|-------------------------|-----------|
| <b>AGV142LA200</b>  | 48V     | 2.4 m/s | NO    | CANbus                  | 54        |
| <b>AGV142LA20X</b>  | 48V     | 2.4 m/s | YES   | CANbus                  | 54        |

<sup>1</sup> If you require an Ethernet drive type then add an 'E' to the end of the order code. e.g. AGV142LA200E

# MECHANICAL SPECIFICATIONS

## DUAL DRIVE CHARACTERISTICS

Our Medium Power Dual Channel, Motor Controllers, have advanced core technology, multiple connectivity options and scripting support. Up to 2 x 180A. Conduction cooling plate with ABS plastic cover. Supports trapezoidal commutation and sinusoidal mode with field oriented control.

| Drive Type | CH | Amps /CH | Volts | STO | Ethernet         |
|------------|----|----------|-------|-----|------------------|
| SBL2360T   | 2  | 30       | 60    | YES | NO               |
| FBL2360T   | 2  | 60       | 60    | YES | NO               |
| FBL2360TE  | 2  | 60       | 60    | YES | YES              |
| GBL2660    | 2  | 180      | 60    | NO  | NO               |
| GBL2660E   | 2  | 180      | 60    | NO  | YES <sup>1</sup> |



<sup>1</sup> STO available, pending certification.

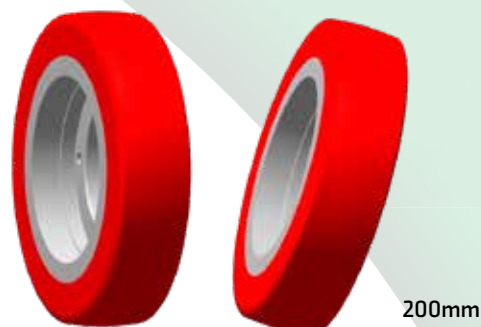
## BRAKE CHARACTERISTICS - SPRING APPLIED

| Frame Size | Supply Voltage (V) | Power (W) | Torque (Nm) | Release Time (ms) | Maximum Backlash (°) |
|------------|--------------------|-----------|-------------|-------------------|----------------------|
| AGV 089    | 24                 | 15        | 4           | 30                | 3                    |
| AGV 142    | 24                 | 17.5      | 16          | 64                | 0.38                 |



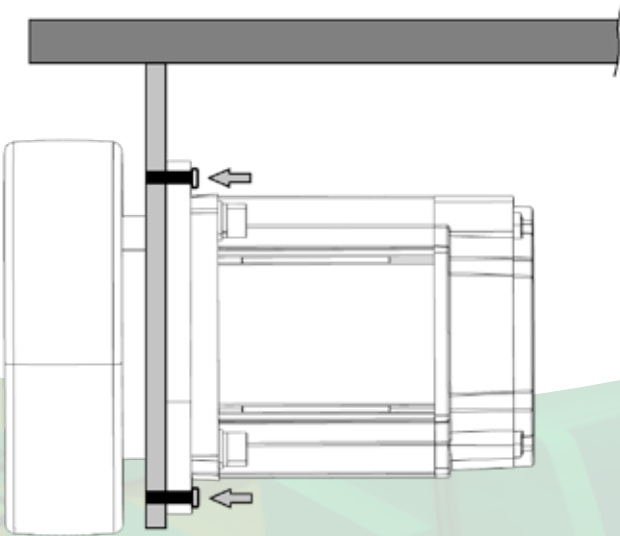
## AGV WHEEL CHARACTERISTICS

Material: AL Alloy  
 Type: Rubber 75+5 Shore A (Thermoset Castable Polyester Based MDI Polyurethane).  
 Finish: Red, adhesion to meet ASTM D-3359 3B.

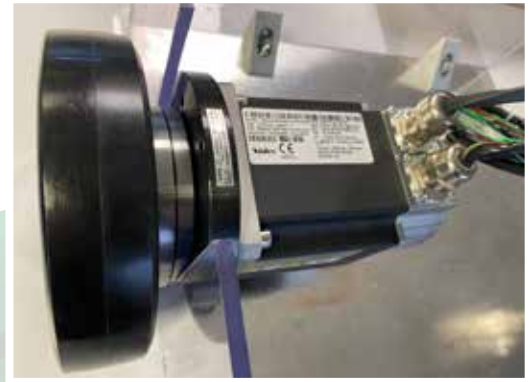


# MECHANICAL SPECIFICATIONS

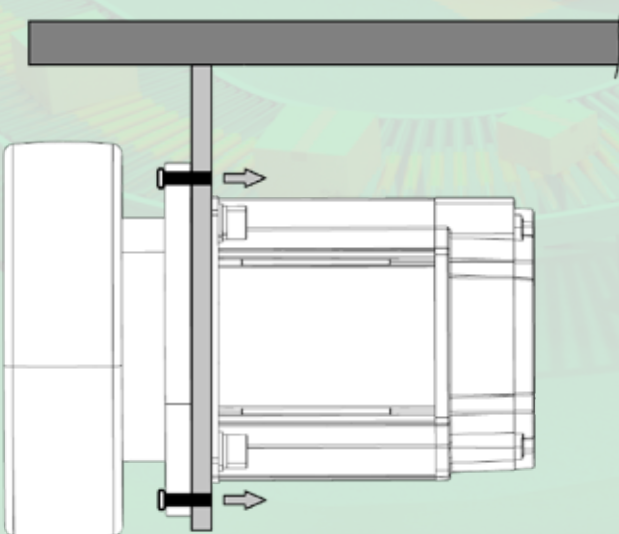
## AGV SOLUTIONS MOUNTING OPTIONS



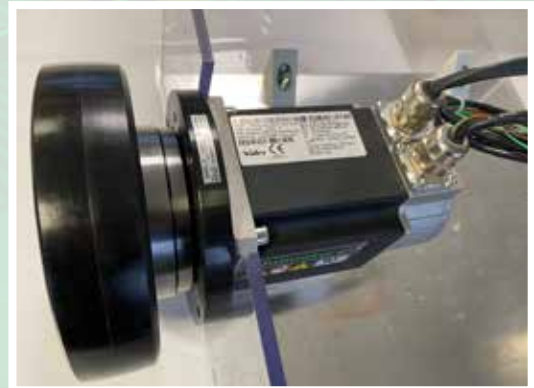
**INTERNAL MOUNT**



Mounted from inside the AGV, the bolts go through the motor mounting plate from the rear and attach to the inside of the AGV body. Take care in leaving enough clearance between the AGV motor wheel and the AGV body.



**EXTERNAL MOUNT**



Mounted from outside the AGV, the bolts go through the motor mounting plate from the front and attach to the outside of the AGV body. This does not affect the clearance between the AGV motor wheel and the AGV body.

| AGV SOLUTION MOUNTING |                             |
|-----------------------|-----------------------------|
| MOTOR FRAME           | MOUNTING PLATE THROUGH HOLE |
| AGV 060               | Ø6.5                        |
| AGV 089               | Ø6.5                        |
| AGV 142               | Ø8.3                        |

| AGV WHEEL MOUNTING |               |             |
|--------------------|---------------|-------------|
| MOTOR FRAME        | MOUNTING BOLT | TORQUE (Nm) |
| AGV 060            | M5 x 25       | 5.7         |
| AGV 089            | M5 X 25       | 5.7         |
| AGV 142            | M8 X 25       | 23.0        |

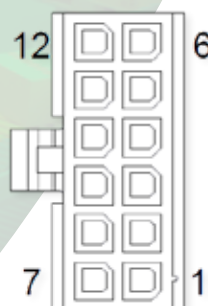


# ELECTRICAL SPECIFICATIONS

## MOTOR CONNECTIONS

### SIGNAL

| Pin | Colour | Function | Pin | Colour | Function |
|-----|--------|----------|-----|--------|----------|
| 1   | RED    | POWER    | 7   | YELLOW | CHA      |
| 2   | GREEN  | HALLA    | 8   | -      | -        |
| 3   | BROWN  | HALLB    | 9   | BLUE   | CHB      |
| 4   | WHITE  | HALLC    | 10  | -      | -        |
| 5   | BLACK  | GROUND   | 11  | -      | -        |
| 6   | -      | -        | 12  | -      | -        |



Signal connection: 500mm flying lead, M16 gland.

AWG PVC wire, insulated in ULAWM 2725 PCV jacket, screened, 12-Way Molex connector 43025-1200.

### POWER

| Pin | Colour       | Function |
|-----|--------------|----------|
| 1   | ORANGE       | U        |
| 2   | RED          | V        |
| 3   | YELLOW       | W        |
| 4   | GREEN/YELLOW | EARTH    |

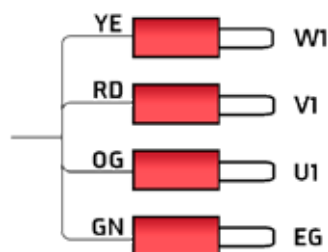
| Motor Frame | Connection  |             |
|-------------|-------------|-------------|
|             | Gland Size* | Output Type |
| AGV 060     | M10         | Ferrules    |
| AGV 089     | M16-M20     | Spade       |
| AGV 142     | PG21        | Ring        |

\* Dependant on winding speed & voltage.

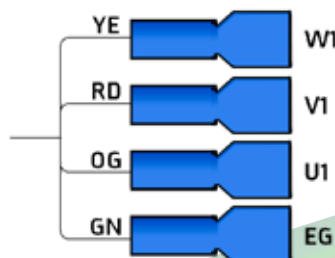
Power connection: 500mm flying lead.

AWG UL 1330 wire, with polyolefin heat-shrink sleeve, with Ferrules, Spade connectors or M6 Ring terminals (as per images below), fitted to lead wires.

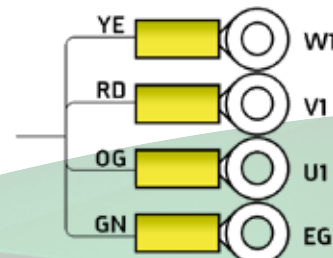
#### SBL Drive



#### FBL Drive



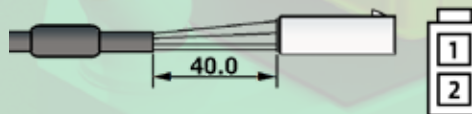
#### GBL Drive



NB. Depending on winding speed, there may be a requirement for x8 phase wires and the colour of spade connectors will differ. Please contact drive centres for more information.

### BRAKE

| Pin | Colour | Function |
|-----|--------|----------|
| 1   | WHITE  | +VE      |
| 2   | BLACK  | -VE      |



Brake connection: 500mm flying lead.

AWG PCV wire, insulated, 2-Way Molex connector 39-01-3029.

# ELECTRICAL SPECIFICATIONS

## MOTOR FEEDBACK SPECIFICATION

AGV 060



CTD (KU) Incremental Encoder - 1024ppr,  
MPS Sensor Chip, Push-Pull Comms.

AGV 089 / AGV 142

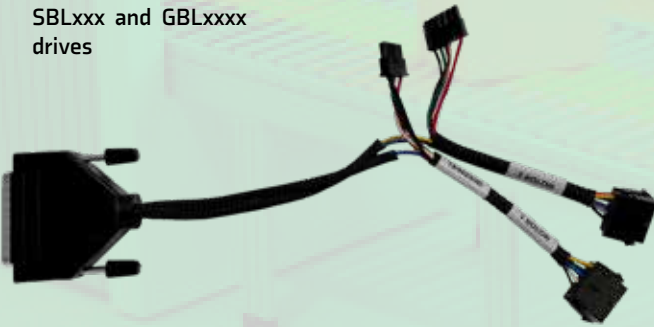


R35i (CJ) Incremental Encoder - 4096ppr,  
5PP, Single Ended Push-Pull Comms.

\*SiL2 safety option available on request.

## DRIVE CONTROL SPLITTER CABLES

SBLxxx and GBLxxxx  
drives



FBLxxx  
drives



Splitter cables are 285mm in length.

For detailed datasheets, configuration files and more information on all of the solutions, please visit our website: [www.controltechniquesdynamics.com/custom-solutions-agv](http://www.controltechniquesdynamics.com/custom-solutions-agv)

For complete instructions on how to build and AGV please follow the link below:-  
[www.roboteq.com/robonidec-agv2020-instructions](http://www.roboteq.com/robonidec-agv2020-instructions)



# Nidec

All for dreams

## #1 for advanced motor and drive technology

Nidec Corporation is a global manufacturer of electric motors and drives. Founded in 1973, Nidec has worldwide operations and a workforce of more than 110,000 who develop, manufacture and install motors, drives and control systems in industrial plants, automobiles, home appliances, office equipment and information technology.



**110,000**  
EMPLOYEES  
WORLDWIDE



**\$13.7B**  
GROUP  
TURNOVER



**70+**  
COUNTRIES



**230+**  
COMPANIES



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