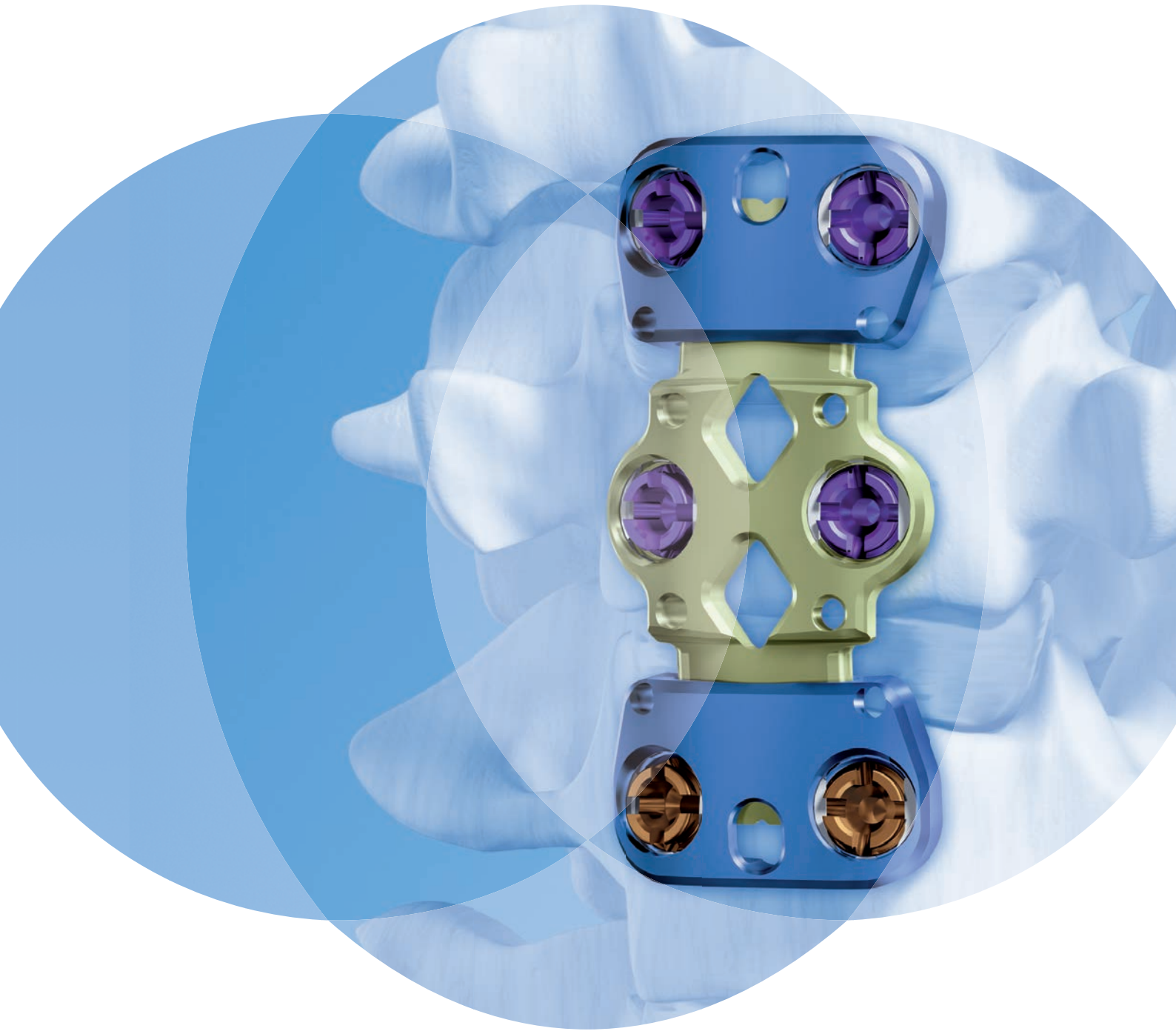
DePuy Synthes

PART OF THE Johnson & Johnson FAMILY OF COMPANIES

VECTRA-T

The Translational Anterior Cervical Palate System



This publication is not intended for distribution in the USA.

SURGICAL TECHNIQUE

Image intensifier control

This description alone does not provide sufficient background for direct use of DePuy Synthes products. Instruction by a surgeon experienced in handling these products is highly recommended.

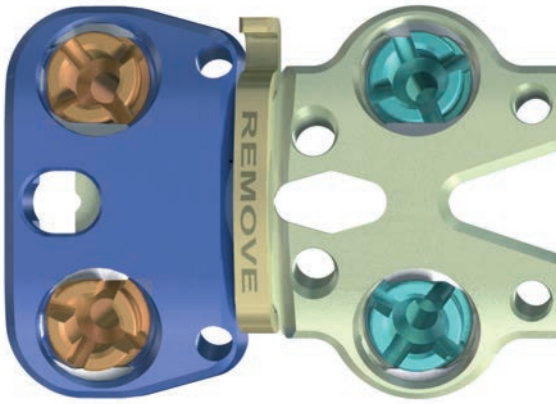
Processing, Reprocessing, Care and Maintenance
For general guidelines, function control and dismantling of multi-part instruments, as well as processing guidelines for implants, please contact your local sales representative or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance
For general information about reprocessing, care and maintenance of Synthes reusable devices, instrument trays and cases, as well as processing of Synthes non-sterile implants, please consult the Important Information leaflet (SE_023827) or refer to:
http://emea.depuysynthes.com/hcp/reprocessing-care-maintenance

Table of Contents

Vectra-T. The Translational Anterior Cervical Plate System

Plates
- Integrated blocking mechanism
- Prelordosed
- Large graft visibility window
- 19 mm wide and 2.5 mm thin
- Titanium alloy plate (TAN)
- Integral Elgiloy clips lock the screws to the plate

Screws
- Screws are color coded to identify function and diameter1
- Regular screw diameter 4.0 mm
- Each screw type is also available with diameter 4.5 mm for revision or where higher purchase is required



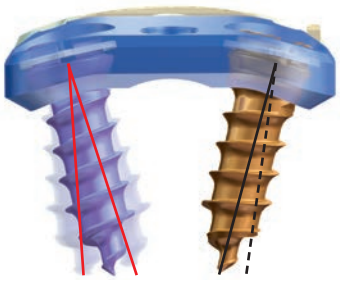
1 Self-drilling screws shown, same color code applies to self-tapping screws

Fixed angle screws
- Cephalad/caudal: offset of 8°
- Medial/lateral: offset of 7°

brown 4.0 mm

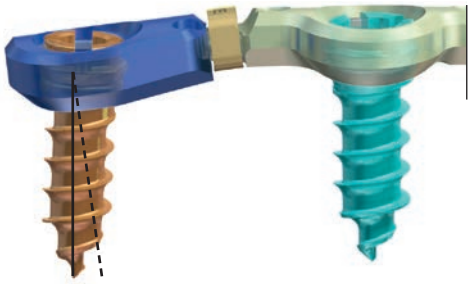
aqua 4.5 mm

Medial/lateral angulation



14° range 7° offset

Cephalad/caudal angulation

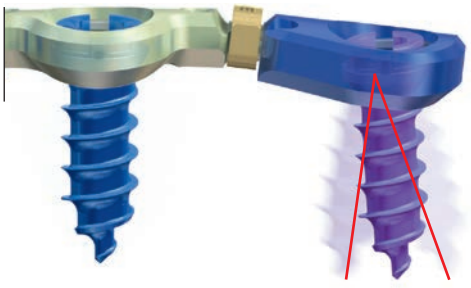


8° offset

blue 4.5 mm

purple 4.0 mm

Variable angle screws
- Cephalad/caudal 28° range
- Medial/lateral 14° range



28° range

Screw placement

- All 3- and 4-level Vectra-T plates are designed with a recommended cranial end—the end with the elongated holes.
- Any screw may be placed in the round screw holes.
- Only Variable Angle screws may be placed in elongated holes.
- Post holes for the Drill and Screw Guide indicate the end of the elongated hole where screws must be inserted for translation.

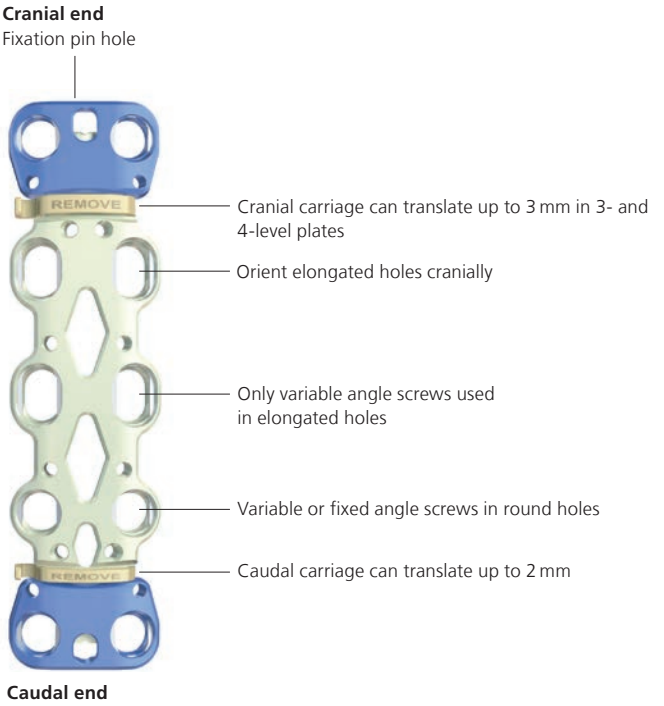
Translation

- The carriage on the cranial end (for 3- and 4-level plates only) can translate 3 mm while all other carriages can translate 2 mm.
- Intermediate elongated holes allow screws to translate up to 2 mm.
- Total amount of translation can be customized (e.g., for a corpectomy) by removing carriage spacers and moving the carriages within the allowable range before screw placement.
- All carriage spacers must be removed after screw insertion.

Discectomy-corpectomy combination

With the Vectra-T System, a stable discectomy-corpectomy combination can be achieved by allowing a corpectomy to be done on the cranial end and the discectomy to be done at the caudal end.

Note: If the discectomy is done above the corpectomy, turn the plate around for optimal fixation.



AO Principles

In 1958, the AO formulated four basic principles, which have become the guidelines for internal fixation.[1] They are:

Anatomic reduction
- Plates are available in multiple lengths to allow proper reduction of the vertebral column
- Prelordosed plates restore lordotic curvature of the cervical spine

Stable internal fixation
- Stabilizes the motion segment
- Protects against excessive loads
- Allows load transmission through graft to facilitate fusion (Wolff's Law)

Atraumatic surgical technique
- Instrumentation designed for a minimal incision

Early, pain-free mobilization
- The added stability of the plate enables earlier mobilization of the cervical spine while providing an optimal environment for fusion.

[1] Müller ME, Allgöwer M, Schneider R, Willenegger (1991) Manual of Internal Fixation. 3rd ed. Berlin Heidelberg New York: Springer

Indications and Contraindications

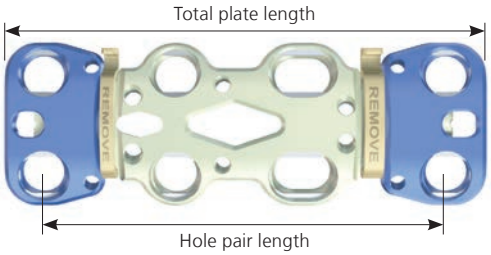
Indications
The Vectra-T System is intended for anterior plate and screw fixation of the cervical spine (C2–C7) for the following indications:
- Degenerative disc disease (DDD, defined as neck pain of discogenic origin with degeneration of the disc confirmed by history and radiographic studies)
- Spondylolisthesis
- Spinal stenosis
- Tumors (primary and metastatic)
- Failed previous fusions
- Pseudarthrosis
- Deformity (i.e kyphosis, lordosis and/or scolosis)

Contraindications
- Severe osteoporosis
- Any indication where fusion is not required

Note for long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable case.

Implants

Vectra-T plate options



One-level plates

Art. No.	Hole pair length mm	Plate length mm
450.551*	14	23
450.552*	16	25
450.553*	18	27
450.554*	20	29
450.555*	22	31
450.556*	24	33
450.557*	26	35

Two-level plates

Art. No.	Hole pair length mm	Plate length mm
450.561*	28	37
450.562*	30	39
450.563*	32	41
450.564*	34	43
450.565*	36	45
450.566*	38	47
450.567*	40	49
450.568*	42	51
450.569*	44	53
450.570*	46	55

*All implants are also available sterile packed. Add suffix "S" to article number.

Three-level plates

Art. No.	Hole pair length mm	Plate length mm
450.571*	45	54
450.572*	48	57
450.573*	51	60
450.574*	54	63
450.575*	57	66
450.576*	60	69
450.577*	63	72
450.578*	66	75
450.579*	69	78

Four-level plates

Art. No.	Hole pair length mm	Plate length mm
450.581*	60	69
450.582*	64	73
450.583*	68	77
450.584*	72	81
450.585*	76	85
450.586*	80	89
450.587*	84	93
450.588*	88	97
450.589*	92	101
450.590*	96	105
450.591*	100	109

*All implants are also available sterile packed. Add suffix "S" to article number.

Vectra-T screw options

- Variable angle screws (purple and blue)
- Fixed angle screws (brown and aqua)
- Regular screw diameter 4.0 mm
- Each screw type is also available with diameter 4.5 mm for revision or where higher purchase is required
- Monocortical screw lengths range from 12–18 mm (self-drilling and self-tapping cancellous screws)
- Bicortical screw lengths range from 18–26 mm (self-tapping cortex screws)
- Screws are color coded to identify type and diameter
- Material: Titanium alloy (TAN)

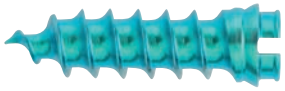
Variable angle

purple 4.0 mm

blue 4.5 mm

Fixed angle

brown 4.0 mm



aqua 4.5 mm

Standard screws

Self-drilling screws, cancellous

04.613.514/516*	4.0 mm, variable angle, 14 mm, 16 mm
04.613.564/566*	4.5 mm, variable angle, 14 mm, 16 mm
04.613.714/716*	4.0 mm, fixed angle, 14 mm, 16 mm
04.613.764/766*	4.5 mm, fixed angle, 14 mm, 16 mm

Available lengths

Self-drilling screws, cancellous

04.613.512–518*	4.0 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.562–568*	4.5 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.712–718*	4.0 mm, fixed angle, 12–8 mm, increments of 2 mm
04.613.762–768*	4.5 mm, fixed angle, 12–18 mm, increments of 2 mm

Self-tapping screws, cancellous

04.613.612–618*	4.0 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.662–668*	4.5 mm, variable angle, 12–18 mm, increments of 2 mm
04.613.812–818*	4.0 mm, fixed angle, 12–18 mm, increments of 2 mm
04.613.862–868*	4.5 mm, fixed angle, 12–18 mm, increments of 2 mm

Self-tapping bicortical screws, cortical

04.614.618–626*	4.0 mm, variable angle, 18–26 mm, increments of 2 mm
04.614.668–676*	4.5 mm, variable angle, 18–26 mm, increments of 2 mm

Self-drilling **Self-tapping**

*All implants are also available sterile packed. Add suffix "S" to article number.

Vario Case

68.613.000	Vario Case for Vectra and Vectra-T

68.613.000.02	Insert, size 1/4, for additional items, for Vario Case No. 68.613.000

68.613.020	Module for Vectra-T Plates 4.0/4.5 (1 to 3 levels plates), for Vario Case No. 68.613.000

68.613.030	Insert for Screws, for Vectra and Vectra-T, for Vario Case No. 68.613.000

Optional

68.613.021	Additional Module for Vectra-T Plates 4.0/4.5 (4 levels plates), for Vario Case No. 68.613.000

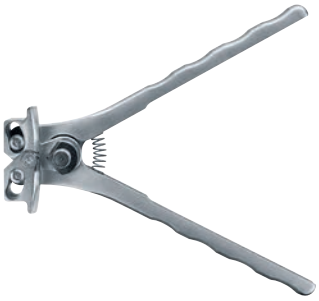
Instruments

Plate manipulation instruments

324.101	Fixation Pin for temporary use Holds the plate securely to the bone prior to final placement of screws.

324.101S	Fixation Pin for temporary use, sterile
352.312	Holding Sleeve for temporary Fixation Pin For use with Screwdriver 324.105.

03.600.004	Bending Pliers for Vectra Plates For contouring Vectra-T plates to the desired curvature.



Screw site preparation instruments

311.402	Tap for Cancellous Bone Screws ∅ 4.0 mm, length 220 mm, in combination with 324.107	
311.404	Tap for Cancellous Bone Screws ∅ 4.5 mm, length 220 mm, in combination with 324.107	
324.107	Handle with Quick Coupling For use with drill bits and taps.	
324.111	Awl ∅ 2.5 mm with trocar tip Breaks the cortex.	
324.151–159	Drill Bit ∅ 2.5 mm, lengths 12–20 mm, 2-flute, for Quick Coupling, in combination with 324.107	
03.613.222–226	Drill Bit ∅ 2.5mm, lengths 22–26mm, 2-flute, for Quick Coupling, in combination with 324.107	
387.292	Screw length indicator, depth up to 50 mm For determining the correct screw length	

03.600.002	Drill Guide 8.0/3.2, with fixed angle, for Vectra and Vectra-T Functions as a plate holder and works as a guide for drill bits when preparing insertion of fixed angle screws.	
03.600.003	Drill Guide 8.0/3.2, with variable angle, for Vectra and Vectra-T Functions as a plate holder and works as a guide for drill bits when preparing insertion of variable angle screws.	
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T Facilitates use of awl, drill bits and taps and allows for fixed and variable angle screw insertion.	

Screw insertion instrument

324.105	Screwdriver for Insertion, self-holding For inserting screws and temporary fixation pins.	

Extraction and revision instruments

324.071	Cleaning Instrument for Screw Head For removal of tissue in the screw head prior to attaching the Screwdriver for Extraction.	
352.311	Screwdriver for Extraction For extracting screws from the plate.	

1

Select and insert graft

Following approach and decompression, insert the appropriately sized graft.

2
Select and bend plate

Required Instrument	
03.600.004	Bending Pliers for Vectra Plates

Optional Instruments	
03.600.002	Drill Guide 8.0/3.2, with fixed angle, for Vectra and Vectra-T
03.600.003	Drill Guide 8.0/3.2, with variable angle, for Vectra and Vectra-T

Select a plate with appropriate hole spacing. Plate may be brought in position with the Drill Guide (fixed angle or variable angle).

Precaution: It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.

After plate length has been determined, ensure that the prelordosed plate fits the anatomy. The plate contour can be adjusted using the Bending Pliers at the bend grooves of the plate.

Precautions:
- Repeated bending may weaken the plate.
- Do not bend the plate at the holes or carriages.
- Bending the shortest 1- and 2-level plates (450.551, 450.552, 450.561, 450.562 and 450.563) may impede the translational mechanism and is not recommended. These plates are made with additional lordosis.

Increase lordotic bend

Decrease lordotic bend

3
Secure plate with Fixation Pins

Required Instruments	
324.101(S)	Fixation Pin for temporary use, (sterile)
324.105	Screwdriver for Insertion, self-holding
Optional Instrument	
352.312	Holding Sleeve

When the plate is positioned appropriately, secure it with a Fixation Pin, using the Screwdriver for Insertion and, if needed, the additionally available Holding Sleeve. Screw the pin into the vertebral body. Insert a second pin into the opposite plate hole.

Additional temporary Fixation Pins may be inserted if desired.

Precaution: Intraoperative imaging should be used for a lateral view of the position of the fixation pins to indicate the potential positions of the screws.

Option A:
Awl and Self-Drilling Variable Angle Screws

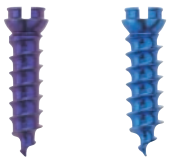
A1

Break cortex
Required Instrument

324.111	Awl ∅ 2.5 mm with trocar tip

Insert the awl by rocking it into the screw hole. Push down at the desired screw angle, while twisting the awl handle. Remove the awl while maintaining hole and plate alignment. To remove the awl, pull straight up to disengage it from the clip. Do not angle or lever the awl to either side.

Precaution: Intraoperative imaging should be used to verify awl position.



4.0 mm 4.5 mm

A2

Insert variable angle screw

Required Instrument

324.105	Screwdriver for Insertion, self-holding

Load the appropriate length variable angle self-drilling screw onto the Screwdriver. Advance the screw until the head of the screw is fully seated in the plate and the plate is lagged to the bone.

Warning: For long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable cases.

Precautions:

- Only variable angle screws are recommended in the elongated holes of 3- and 4-level plates. The screw head geometry of fixed angle screws may impede translation.
- It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.
- Intraoperative imaging should be used to verify screw position.
- Any screw may be placed in the round screw holes.
- The total amount of translation can be customized (e.g., for a corpectomy) by removing carriage spacers and moving the carriages within the allowable range before screw placement.
- The carriage on the cranial end (for 3- and 4- level plates only) can translate 3 mm while all other carriages can translate 2 mm.
- Intermediate elongated holes allow screws to translate up to 2 mm.

A3

Remove carriage spacers

Once the construct is complete and all screws are placed, use forceps to remove the carriage spacers.

The plate is now free to translate.

Option B:
Drill Sleeves and Self-Tapping Screws

B1
Select Drill Guide

Required Instruments	
03.600.002	Drill Guide 8.0/3.2, with fixed angle, for Vectra and Vectra-T
03.600.003	Drill Guide 8.0/3.2, with variable angle, for Vectra and Vectra-T

Choose either the fixed angle or variable angle Drill Guide. Color bands on Drill Guides correspond to the color of the screws associated with each guide.

B2

Drill pilot hole

Required Instruments	
324.151–159	Drill Bits ∅ 2.5 mm, lengths 12–20 mm, for Quick Coupling
03.613.222–226	Drill Bits ∅ 2.5 mm, lengths 22–26 mm, for Quick Coupling
324.107	Handle with Quick Coupling
Optional Instrument	
387.292	Screw length indicator, depth up to 50 mm

Insert the Drill Guide by rocking it into the screw hole. Use the appropriate length drill bit and handle to drill the pilot hole for the screw. The depth stop will contact the Drill Guide to limit drilling depth.

Precaution: Intraoperative imaging should be used to check the drilling operation.

B3

Remove Drill Guide

Remove the Drill Guide by pulling straight up to disengage it from the clip. Do not angle or lever the sleeve to either side.

B4

Insert screw

Required Instrument	
324.105	Screwdriver for Insertion, self-holding
Optional Instruments	
311.402	Tap for Cancellous Bone Screws ∅ 4.0 mm
311.404	Tap for Cancellous Bone Screws ∅ 4.5 mm
324.107	Handle with Quick Coupling

Load the appropriate length variable angle or fixed angle self-tapping screw onto the screwdriver. Advance the screw until the head of the screw is fully seated in the plate and the plate is lagged to the bone.

Warning: For long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable cases.

Precautions:

- Only variable angle screws are recommended in the elongated holes of 3- and 4-level plates. The screw head geometry of fixed angle screws may impede translation.
- It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.
- Intraoperative imaging should be used to verify screw position.

B5

Remove carriage spacers

Once the construct is complete and all screws are placed, use forceps to remove the carriage spacers.

The plate is now free to translate.

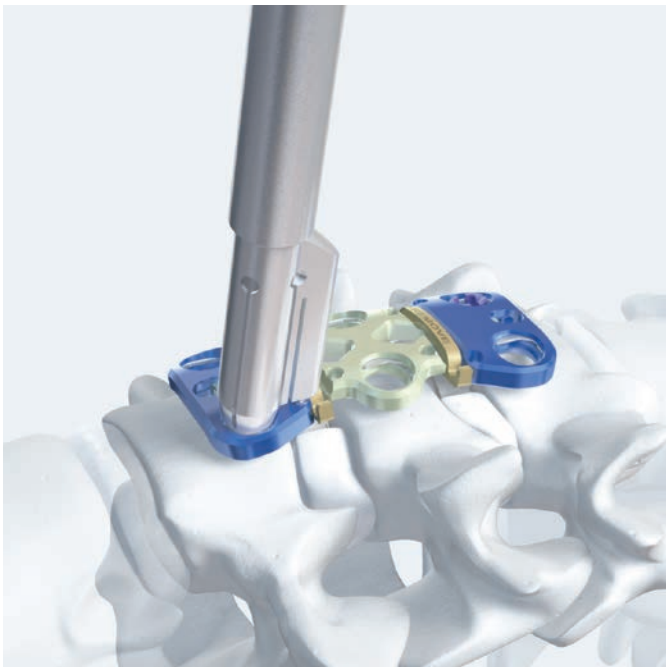
Option C:
Drill and Screw Guide

C1
Insert Drill and Screw Guide

Required Instrument	
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T

Use the Drill and Screw Guide in the small post holes.

C2
Drill



Required Instruments	
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T
324.151–159	Drill Bits ∅ 2.5 mm, lengths 12–20 mm, for Quick Coupling
03.613.222–226	Drill Bits ∅ 2.5 mm, lengths 22–26 mm, for Quick Coupling
324.107	Handle with Quick Coupling
Optional Instruments	
311.402	Tap for Cancellous Bone Screws ∅ 4.0 mm
311.404	Tap for Cancellous Bone Screws ∅ 4.5 mm
324.111	Awl ∅ 2.5 mm with trocar tip
387.292	Screw length indicator, depth up to 50 mm

Insert the appropriate length drill bit through the barrel of the Drill and Screw Guide and drill the hole. The depth stop will contact the guide to limit drilling depth.

Precaution: Intraoperative imaging should be used to check the drilling operation.

Alternatively
Insert the Awl through the barrel of the Drill and Screw Guide, pushing down while twisting the awl handle.

Precaution: Intraoperative imaging should be used to verify awl position.

C3

Insert screw

Required Instruments	
03.613.001	Drill and Screw Guide, for Vectra and Vectra-T
324.105	Screwdriver for Insertion, self-retaining

Insert the appropriate length screw through the barrel of the Drill and Screw Guide and advance it until the screw head almost engages the plate (as indicated by the groove on the screwdriver shaft lining up with the top of the Drill and Screw Guide). Retract the Drill and Screw Guide by pulling it along the screwdriver shaft, just before the screw seats in the plate hole, to visually confirm that the screw is seating. Advance the screw until it lags the plate to the bone.

Warning: For long spans or poor bone quality: The surgeon is urged to consider the nature of such cases. The treatment may require the use of screws longer than 16 mm, and/or posterior fixation for this kind of inherently unstable cases.

Precautions:

- Only variable angle screws are recommended in the elongated holes of 3- and 4-level plates. The screw head geometry of fixed angle screws may impede translation.
- It must be considered that the intervertebral discs in the neck region are slightly inclined from anterocaudal to posterocranial. Screws should remain in the vertebral body and not penetrate the intervertebral discs. Make sure there will be enough space between the intact adjacent intervertebral discs and the screws.
- The 4.5 mm screw may be used as an emergency screw where the 4.0 mm screw has stripped the bone and a larger screw thread is required.
- Intraoperative imaging should be used to verify screw position.

C4

Remove carriage spacers

Once the construct is complete and all screws are placed, use forceps to remove the carriage spacers.

The plate is now free to translate.

1
Clean screw head

Required Instrument	
324.071	Cleaning Instrument for Screw Head

If access to the screw head is blocked by tissue, use the Cleaning Instrument for Screw Head to clean out material. Insert the instrument into the screw head and twist the handle back and forth until material is removed.

2
Remove screw

Required Instrument	
352.311	Screwdriver for Extraction

For screw removal the Screwdriver for Extraction must be used. Insert the driver shaft into the screw head recess. Tighten the knob on the handle to thread the threaded tip of the inner shaft into the mating thread of the screw. Advance the sleeve downward to contact the upper surface of the plate by turning the sleeve clockwise.

Do not rotate the sleeve after it has contacted the surface of the plate. While holding the sleeve, turn the handle counterclockwise to extract the screw.

Precaution: After the second screw insertion trial, the plate needs to be replaced.

Precaution: If the inner shaft knob is not fully tightened to the handle, breakage of the driver may occur and could potentially harm the patient.

Warning: The extraction screw driver should only be used for screw removal; use of the extraction screwdriver for screw insertion may lead to driver and/or implant breakage.

Insert the driver shaft into the screw head recess.

Tighten the knob on the handle to thread the inner shaft into the mating thread of the screw.

Advance the sleeve downward.

Turn the handle counterclockwise while holding on to the sleeve to extract the screw.

3
Remove plate

After all the screws have been romoved, the plate can then be removed.

DePuy Synthes
PART OF THE Johnson&Johnson FAMILY OF COMPANIES
People inspired™

Synthes GmbH
Eimattstrasse 3
4436 Oberdorf
Switzerland
Tel: +41 61 965 61 11
Fax: +41 61 965 66 00
www.depuysynthes.com

Not all products are currently available in all markets.

This publication is not intended for distribution in the USA.

All surgical techniques are available as PDF files at
www.depuysynthes.com/ifu

CE
0123

 036.000.448 DSEM/SPN/0316/0468 07/16