MANUFACTURER SPECIFIC TRANSLATION OF ICD PROGRAMMING RECOMMENDATIONS‡

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BIOTRONIK

All "I-family" devices Iforia, Ilesto, Idova, Iperia, Itrevia and Inventra and Lumax 740; Single, Dual chamber devices, CRT-D devices and VR-DX devices.

Brady	Single Chamber VVI 40 bpm Dual Chamber DDD-CLS with IRS Plus / I OPT *or* DDD with Vp Suppression +/- Rate Response CRT DDD-CLS *or* Rate Response
Detection	In patients with no VT history[1] VF: 231 bpm, 24/30 intervals (30/40 in *Iperia, Itrevia and Inventra*) VT2: 188 bpm[2], 30 intervals VT1: Monitor zone at user discretion In patients where VT CL is known VF 231 bpm (minus Safety Margin[3]), 24/30 intervals VT2: 188 bpm[2] (minus Safety Margin[3]), 30 intervals VT1: Therapy at 10-20bpm < VT CL or Monitor zone at user discretion
Therapy	VF: ATP One-Shot, 1 burst of 8 pulses at 85% CL, then full output shocks VT2: ATP ≥1 bursts of 8 pulses at 85% CL, 10ms scan decrement, then shocks VT1: Therapy as for VT2 (favoring more ATP) or Monitor zone
SVT Discriminators	Single Chamber MorphMatch ON in *Iperia, Itrevia and Inventra*[4] Onset ON 20% (default) Stability ON 40ms (unless likely polymorphic VT then Stability OFF) Sustained VT Timer OFF Dual Chamber/CRT-D SMART ON at default settings (or adapted to known VT)
Sensing Rejection	Lead Integrity check ON (if available) BIOTRONIK HomeMonitoring ON (if available)

[1] SVT discriminators are linked to Detection Zones. An alternative configuration would be VF 250 bpm, VT2 230 bpm and VT1 188 bpm with therapy (i.e. no Monitor zone) if >1 ATP attempt desired up to 250 bpm.
[2] 194 or 200 bpm are also within guidelines for the lower limit of this zone
[3] Safety Margin: If clinical VT CL is known, a detection zone should be set at 10-20 bpm below documented rate

[4] In order to have MorphMatch on in the VT2 zone, device must be programmed to three zones with VT1 zone as monitor or therapy zone as required. This does not apply to dual chamber SVT discriminators.

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Boston Scientific

Most settings are nominal in newest devices. Those that are not nominal are marked with an asterisk.

Brady	<u>Single Chamber</u> VVI, 40bpm* <u>Dual Chamber</u> DDD with RYTHMIQ™* or AV Search +* (± rate response) <u>CRT</u> DDD ± rate response Smart Delay™ Optimization of AV delays
Detection	<u>In patients with no VT history</u> VF:8 of 10 intervals plus 5 second delay*, 250 bpm* VT:8 of 10 intervals plus 12 second delay*, 185[1] bpm* VT-1: Monitor zone at user discretion, ≥12 second duration* <u>In patients where VT cycle length is known</u> VF:5 second duration*, 250 bpm* VT: 12 second duration*, 185[1] bpm* or 10-20bpm < VT rate VT-1: Therapy at 10-20bpm < VT CL, ≥12 second duration* or Monitor zone
[1] 190, 195 or 200bpm are also within guidelines for the lower limit of this zone	
Therapy	VF: Quick Convert™ ON to 300bpm* (if available) All shocks: Maximum output VT: ATP-1: Scan, ≥1 bursts, 8 pulses* at 84%* coupling interval and cycle length (Minimum 200ms*), 10ms decrement* ATP-2: OFF* All shocks: Maximum output VT-1: As for VT, favoring more ATP
SVT Discriminators	<u>ICD</u> Rhythm ID®: ON <u>CRT-D</u> Onset/Stability: ON *or* Rhythm ID®: ON* Sustained Rate Duration (SRD): OFF* SVT Discriminators apply only up to 230 bpm
Oversensing Rejection	Non-physiological Signal Detected: ON (LATITUDE™)
Others	Turn on "Beep When Out-of-Range" Daily Lead Measurements* RV Pacing Impedance Abrupt Change alert ON (LATITUDE™) Single Chamber: Consider %RV pacing alert ON (LATITUDE™) Dual Chamber: Consider %RV pacing alert in non AVB patients ON (LATITUDE™) CRT-D: Consider CRT % pacing alert ON (LATITUDE™)
SUBCUTANEOUS ICD (EMBLEM™ S-ICD)	
Settings	Shock Zone: From 230bpm Conditional Zone: From 200bpm Consider post-shock pacing ON

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Medtronic

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Brady	<u>Single Chamber</u> VVI 40bpm <u>Dual Chamber</u> Managed Ventricular Pacing (MVP; AAI ↔ DDD) ± rate response <u>CRT</u> DDD Patient with Intact AV conduction – Adaptive BiV & LV* (if available) Patient with prolonged PR interval – Adaptive BiV (if available)
Detection	<u>In patients with no VT history</u> VF:30/40 intervals, 188 bpm[1] FVT: OFF[2] VT:OFF VT Monitor: User discretion <u>In patients where VT CL is known</u> VF:30/40 intervals, 188 bpm[1] FVT: OFF[2] VT:24* intervals[3], 10-20bpm < VT rate VT Monitor: User discretion
Therapy	VF: ATP Before* Charging; ChargeSaver ON All shocks: Full output VT (if ON): Rx1: ATP, ≥1 bursts of 8 pulses at 88% VT CL, 10ms Decrement Rx2-6: shocks
SVT Discriminators	<u>Single Chamber</u> Wavelet: ON Limit: 260ms (230 bpm) Stability: OFF Onset: OFF <u>Dual Chamber/CRT-D</u> PR Logic: ON (Other 1:1 not turned ON until after lead stabilized at ~3 months) Wavelet: ON (if available) SVT Limit: 260ms (230 bpm) Stability: OFF Onset: OFF
Oversensing Rejection	Lead Integrity Alert: ON T wave Over-Sensing: ON (if available) RV Lead Noise: ON* without timeout (if available)

[1] 194 or 200 bpm are also within guidelines for the lower limit of this zone
[2] Use of ATP Before/During Charging in the VF zone achieves the same functionality as use of the FVT zone
[3] Consecutive count in VT zone; hence, lower NID as per PainFree SST data

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LIVANOVA (formerly Sorin Group)

(OVATIO, PARADYM, PARADYM RF, INTENSIA and PLATINIUM high voltage devices)

Brady

Single Chamber
VVI 40bpm

Dual Chamber
SafeR (± rate response) or DDD (± rate response)

CRT
DDD (± rate response) – with weekly AV + VV SonR optimisation ON*

*requires SonRtip atrial lead with integrated haemodynamic sensor

Detection

In patients with no VT history

VF:	>255 bpm	20 cycle + 6/8 majority
FVT:	230 bpm	20 cycle + 6/8 majority
VT:	185 bpm[1]	20 or 30 cycle + 6/8 majority
Slow VT:	Monitor zone at user discretion	

In patients where VT CL is known

VF:	>255 bpm	20 cycle + 6/8 majority
FVT:	230 bpm	20 cycle + 6/8 majority
VT:	Clinical rate less 10-20 bpm	≥20 cycle + 6/8 majority
Slow VT:	Monitor zone at user discretion	

[1] 190, 195 or 200 bpm are also within guidelines for the lower limit of this zone

Therapy

VF:	6 x 42 J
FVT:	If stable*: 1 x ATP (Burst @ 85% x 8 beats) then 6 x 42 J If unstable: 6 x 42J
VT:	≥1 x ATP (Burst + Scan @ 85% x 8 beats; Scan 8 ms) then 6 x 42 J

*Satisfaction of stability (nominal value = 30 ms) in the Fast VT zone will not prevent therapy but rather activate programmable burst pacing prior to shock therapy.

SVT Discriminators

Single Chamber
Single button programming; Stability+/Acc
Rate, Stability, Degree of Onset, VT long cycle search
Nominal settings: Onset 19%, Stability 65ms (Slow VT, VT); Long cycle extension 10 cycles; Long cycle gap 170 ms.

Dual Chamber/CRT-D
Single button programming; PARAD+
Rate, Stability, AV association analysis, Degree and Chamber of Onset, VT long cycle search
Nominal settings: Onset 25%, Stability 65ms (Slow VT, VT); Long cycle extension 10 cycles; Long cycle gap 170 ms.

Oversensing Rejection

Daily check Lead impedance ON
Daily check Lead coil continuity ON
Daily check V over-sensing alerts ON
T-wave filtering and noise detection are hardcoded in firmware

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St. Jude Medical

Brady	<u>Single Chamber</u> VVI 40bpm <u>Dual Chamber</u> DDD with Ventricular Intrinsic Preference (VIP) ± rate response <u>CRT</u> DDD ± rate response QuickOpt at implant and follow-up
Detection	<u>In patients with no VT history</u> VF:30 intervals, 250 bpm VT2: 30 intervals, 187 bpm[1] VT:Monitor, at user discretion <u>In patients where VT CL is known</u> VF:30 intervals, 250 bpm VT2: 30 intervals, 187bpm or 10-20bpm < VT rate VT:Therapy at 10-20bpm < VT rate or Monitor zone [1] 190, 193, 196 or 200 bpm are also within guidelines for the lower limit of this zone
Therapy	VF: ATP While Charging, 8 pulses at 85% VT CL All shocks: Maximum output (Note: 1st shock 4-6J lower than full output) VT2: ATP, ≥1 bursts of 8 pulses at 85% VT CL Scan step 10ms, Re-adaptive ON, Minimum CL 200ms All shocks VT: As for VT2, favoring more ATP
SVT Discriminators	<u>Single Chamber</u> Morphology: ON, 90%, 3 of 10 All others: "Passive" <u>Dual Chamber/CRT-D</u> Morphology: ON, 90%, 3 of 10 Arrhythmia onset: ON (default settings) Interval Stability: ON (default settings) If ALL For CRT: Template Auto Update 30 days and Template Pacing Hysteresis ON *or* Template Auto Update OFF SVT Upper Limit: 230 bpm SVT Discrimination Timeout: OFF VT Therapy Timeout: OFF
Oversensing Rejection	Low Frequency Attenuation: ON SecureSense RV Lead Noise Discrimination: ON